REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS

PART 4:
PROJECT DESIGN AND CONSTRUCTION REQUIREMENTS

Addendum ~~5~~ 6 - October 27, 2016

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Part 4 Sections

E. Conduct a TMS detector accuracy test after traffic is in final lane locations. Verify the accuracy of detectors by conducting two separate 10-minute speed and volume counts, and comparing them with speed radar gun and hand (video-recorded) counts. 10-minute counts shall be made under typical traffic conditions, on weekdays between 7 a.m. and 10 a.m. and/or between 3 p.m. and 6 p.m. Take corrective action, as necessary, if detector accuracy is not within specified accuracies. If the inaccuracies are due to the State Furnished item, new State Furnished equipment will be provided. As recorded by the detector, the relative occupancy shall be accurate to ±20 percent, and the vehicle speed shall be accurate to ±5 miles per hour (mph). Notify the Department at least seven calendar days prior to beginning testing.

F. Submit ATMS device integration sheets to the Department five days before burn-in date.

G. Submit 30 Day ATMS Burn-in Test Reports prior to Substantial Completion.

H. Notify Department 10 days prior to fiber testing and conduit mandreling to allow witness by the Department. Submit a digital copy (on a disk or thumb drive) of the fiber test sheets to Leon Hadley five days after testing is complete.

3C-14 ATMS Maintenance Access

Design and construct ATMS device and cabinet locations to provide safe and routine maintenance access ~~to accommodate a space of 14 feet wide and 50 feet long~~.

A. Provide bucket truck access to NID poles, CMS catwalk, and CCTV camera poles to re-aim or replace requiring a shoulder closure only. Maintenance access area must be 50-foot long (parallel to the roadway) by 14-foot wide and may include the concrete shoulder adjacent to the travel lanes, but not any portion of the travel lane. The point of reference for measurements on the maintenance access area is located at 10 feet from the closet edge of the maintenance access area that is perpendicular to the traffic flow and a minimum of 7 feet from the edge of the travel lane. The distance measured from the ATMS/VMS/TMS pole to the point of reference of the maintenance access must not exceed 30 feet and both must be in-line and perpendicular to the roadway. The Maintenance Access Pullout must be situated relative to the ATMS pole so the 50 foot section is split by 40 feet downstream to traffic and 10 feet upstream to traffic.

B. Provide a 32 inch tall barrier in the maintenance access (pull out) area for maintenance personnel to access ATMS cabinets behind barrier. The grades on both sides of the barrier must be the same to ease access to the ATMS cabinets behind the barrier. ATMS cabinets not behind barrier shall not have slopes steeper than 1 to 4 in the path to access the cabinet and be no more than 100 feet from a safe parking location.

C. Provide a 12-foot wide by 50-foot long maintenance access within 200 feet of ramp meter cabinet. Locate access on same side of ramp as cabinet.

~~C. Avoid placement of devices or poles in snow storage areas between barriers and sound walls.~~

D. Locate junction boxes with splice enclosures within 25 feet of the shoulder.

E. See Part 7 (Contract Drawings) for ATMS maintenance access details.

6C-4.3 Soil Nail Walls

Meet the requirements of Special Provisions 02871S and 02342S for soil nail walls and shotcrete. Do not use soil nail walls below the existing ground water table.

6C-4.4 Temporary Earth Retaining Structures

Construct temporary excavation support such as sheet pile, soldier piles and lagging, soil nailing, and bracing in accordance with site-specific designs that have been prepared, signed, and sealed by a Professional Engineer licensed in the State of Utah.

Where temporary retaining structures or materials will be incorporated into permanent embankments or retaining structures, the design, construction, and testing must meet the requirements for permanent construction.

6C-5 Seismic Design

6C-5.1 Design Seismic Event Magnitudes

For the design seismic event having a 7 percent probability of exceedance in 75 years, use an earthquake moment magnitude of 7.0. For the design seismic event having a 3 percent probability of exceedance in 75 years, use an earthquake moment magnitude of 7.2.

6C-5.2 Design Seismic Acceleration Coeffecients

Determine the Site Class for each interchange. Calculate the site design acceleration coefficients using interpolated AASHTO site coefficients and the Site Class B acceleration coefficients in Table ~~1~~ 6C-2 (Seismic Acceleration Coefficients for Site Class B) (obtained from the USGS 2008 Hazard Curve Application at http://geohazards.usgs.gov/hazardtool/).

TABLE 6C-2
Seismic Acceleration Coefficients for Site Class B

Probability of Exceedance:	3% in 75 years			7% in 75 years		
Approximate Return Period:	2462 years			1033 years		
Parameter:	PGA	S_s	S_1	PGA	S_s	S_1
11400 South	0.456	1.216	0.344	0.298	0.767	0.213
9000 South	0.462	1.235	0.346	0.305	0.786	0.218
7000 South	0.514	1.374	0.380	0.331	0.853	0.235
5400 South	0.561	1.494	0.413	0.356	0.920	0.252

6C-5.3 Site-Specific Hazard and Response Analyses

Obtain Approval of any site-specific seismic hazard and/or response analysis methodologies and their results prior to their use in design. For this Project, the Department will not Approve use of design spectral response accelerations less than those determined using the General Procedure defined in the AASHTO *Guide Specifications for LRFD Seismic Bridge Design*.

6C-5.4 Design for Seismic Hazards

Account for the effects of seismic ground motions, liquefaction, and soil strength reductions associated with earthquake loading in design of foundations and retaining walls, and in the design of embankments where the seismic performance of the embankment may impact bridges, retaining walls,

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a. Commit to provide Project aesthetics and landscaping in accordance with this Section and the UDOT Baseline Aesthetics Guidelines. Include an additional $100,000 per interchange in the Contract Amount for Project aesthetic and landscaping enhancements, this does not include design costs. Design costs for Project aesthetic and landscaping enhancements is included in the lump sum design cost in the Contract Amount.

b. Build Alternative 4015 West, provide landscape treatment at specific locations as follows:

1. Northwest corner of Sams Boulevard and 4000 West:

a. Protect in place and maintain the existing trees that are not directly displaced by new sidewalk or other Project related elements.

b. Protect in place and/or relocate the existing irrigation system to maintain irrigation to plant material.

c. In new landscape areas and existing landscape areas that are disturbed:

i. Place weed barrier in accordance with this section and use existing landscape rock in accordance with this section.

ii. If additional landscape rock is required, match existing rock and install in accordance with this section.

2. Southeast corner of Point Lane and 4000 West:

a. Place topsoil and roadside seed in accordance with this section and UDOT Standard Specifications.

3. Southeast corner of 5415 South and 4120 West:

a. Place weed barrier and landscape rock in accordance with this section.

B. If landscaping is incorporated, use plant material that is drought-tolerant, and design irrigation systems that minimize water consumption and minimize maintenance.

7C-1 Aesthetics and Landscape Design Packages

For review and acceptance of Aesthetics and Landscape plans follow the UDOT Project Aesthetic and Landscaping Plan Development and Review Policy (08A-03) and Aesthetics Guidelines. This policy requires coordination with the Department, and UDOT Aesthetic Committee and local municipalities involved in the project.

After NTP coordinate with the Department to develop a Conceptual Aesthetics and Landscape Design Package that incorporates elements set forth in this Section, baseline condition, and possible enhancements. Provide Department personnel with necessary support regarding landscape and irrigation design in the form of personnel and/or design data/drawings to assist when coordinating with local municipalities. Coordination with the local municipalities should take place through the development and approval of the Conceptual Aesthetics and Landscape Design Package. Any communication between the Project and the local municipalities will be coordinated through the Department.

Coating).

J. Provide aesthetic Treatments at specific locations:

1. Parcel 523 – Match the existing wall type and color at the existing retaining walls.

7C-3 Monument Features and City Logos

Any proposal or request by local municipalities to incorporate a city monument feature or logo into the Project will be required to follow UDOT Placement of Monument Features and City Logo Panels on State Highways Policy (08A-02) and the Monument Feature and City Logo Panel Design Guidelines.

7C-4 Topsoil

Provide topsoil that is free of petroleum products, construction waste, debris, and particles larger than one inch in any dimension. Use existing topsoil wherever possible. Strip and stockpile topsoil from available open areas to be impacted by the Project.

7C-4.1 Existing Topsoil

Existing topsoil may be stripped and stockpiled from the ROW and other suitable environmentally cleared project areas and re-used on Project disturbed slopes when all of the following criteria are met:

A. The existing topsoil is free of petroleum products, construction waste, and other contaminants.

B. The area being stripped currently supports suitable vegetation.

C. The soils are not currently growing weeds included on the State's noxious weed list.

7C-5 Planting Design Criteria

7C-5.1 Plants

Obtain Approval for all plant selections and sizes. Provide plant material as follows:

A. **Trees:** Along freeways, do not locate any trees within 36 feet of the edge of the traveled way, except in areas shielded by barrier; do not place barrier to provide larger planting areas. Do not locate any trees inside the clear zone or in areas that may obstruct safe view distances from intersections and driveways. If the landscaping plan includes trees planted in the park strip, select trees appropriate for street use that provide adequate vertical clearance for vehicles and pedestrians and minimal overhang of the roadway. Consider mature height and spread of trees in the design. When selecting tree varieties, choose trees that are well adapted to the Project area and that are not susceptible to disease or other problems that will limit successful long-term growth.

1. Protect all existing trees within the Project limits that are not considered weedy species. Provide environmental fence around the canopy or dripline of all existing trees to be protected. Do not park or store equipment and construction material within fenced area of existing trees.

2. Provide tree staking on slopes greater than 4:1 (H:V).

3. For mulching around tree plantings the follow requirements listed under compost and bark mulch in this Section.

4	Poa secunda spp. Sandbergii 'High Plains'	High plains sandberg bluegrass	925,000	1.50	27.05%	31.85	2.25	27.05%	47.78
5	Thinopyrum intermedium 'Tegmar'	Tegmar intermediate wheatgrass	88,000	4.50	7.72%	9.09	6.75	7.72%	13.64
6	Linum lewisii 'Maple Grove"	Maple Grove blue flax	170,000	1.00	3.31%	3.90	1.5	3.31%	5.85
7	Penstemon Eatonii 'Richfield'	Richfield firecracker penstemon	400,000	0.50	3.90%	4.59	0.75	3.90%	6.89
Total				17.00	100.00%	117.75	25.50	100.00%	176.63

7C-7 Invasive Weed Control

Control invasive weeds in all disturbed areas in accordance with Part 5 (Special Provisions and Exceptions) 02924S (Invasive Weed Control). Control invasive weeds for the duration of the Project.

7C-8 Irrigation

Meet the standards for the local municipality for any proposed irrigation. Submit the design of the irrigation to the local municipality and Department for Approval. ~~Irrigation systems should be designed without any overhead spray irrigation (pop-up or rotor) immediately adjacent to the roadway.~~

7C-9 Park Strip, Median, and Island Treatments

Apply one of the following treatment options to park strips, medians, and islands within the Project limits:

A. Stamped Colored Concrete:

1. Use integral concrete color Fed. Std. 36081 or approved equal.
2. Use ashlar slate pattern or approved equal.
3. Provide construction joints that parallel the ashler slate pattern.

B. Cobble Rock:

1. Use 3 to 6-inch cobble rock placed 6 inches in depth.
2. Place weed barrier fabric under rock.
3. For island areas, use a 4-foot wide band of stamped colored concrete (see above) around the perimeter and cobble rock for the interior portion.

7C-10 Landscape Treatments at Specific Locations

Provide landscape treatment at specific locations as follows:

A. Parcels 536, 562, and 565. Use a combination of landscape rock and stamped colored concrete in accordance with this section. Landscape treatments should be used in a manner compatible with the primary use of the parcel.

B. The Oval-A-Bout on 11400 South between River Heights Drive and Summer Heights

Drive. Place native borrow 4 inches below sidewalk and/or top back of curb. Native borrow must be free of petroleum products, construction waste, and other contaminants, including large rocks greater than 3 inches in diameter. Place topsoil and roadside seed in accordance with this section and Department Standard Specifications.

C. The Oval-A-Bout on 11400 South between District Drive and Parkway Plaza Drive. Place native borrow 4 inches below sidewalk and/or top back of curb. Native borrow must be free of petroleum products, construction waste, and other contaminants, including large rocks greater than 3-inches in diameter.

D. Northwest corner of 11400 South and River Heights Drive, the northeast corner of 11400 South and Summer Heights Drive, southwest corner of 11400 South and District Drive, and the southeast corner of 11400 South and Parkway Plaza Drive. Place native borrow 4 inches below sidewalk and/or top back of curb in new landscape areas. Native borrow must be free of petroleum products, construction waste, and other contaminants, including large rocks greater than 3 inches in diameter. Finish landscape to match adjacent landscape treatments, including topsoil, turf sod, ornamental trees, and irrigation in accordance with this section and Department Standard Specifications. Coordinate with adjacent property owners to tie into existing irrigation systems.

~~B.~~E. New Detention Basins. Use landscape rock in accordance with this section.

7D. SUBMITTALS

Provide submittals to the Department in accordance with Table 7D-1.

TABLE 7D – 1
DESIGN-BUILDER SUBMITTALS FOR LANDSCAPING AND AESTHETICS

Submittal	***For Approval***	***Schedule***
Conceptual Aesthetics and Landscape Design Package (Aesthetics committee)	Yes	After NTP
Final Aesthetics and Landscape Design Package	Yes	Obtain Approval prior to Initial Design Milestone Submittal Package for Structures and affected Release for Construction Documents
Sources of material for (i) Landscape Rock, (ii) Compost, and (iii) Bark mulch samples	Yes	Obtain Approval prior to Released for Construction Documents
As-Built Irrigation Plans	No	With As-Built Documents

Separation Fabric

(2) For widening adjacent to existing asphalt for 5400 South, 7000 South, 9000 South, & 11400 South

6 inches HMA

6 inches Untreated Base Course

12 inches Granular Borrow

Separation Fabric

(3) Remove existing concrete pavement and lean base course at 5400 South, 7000 South, & 9000 South and replace with:

10 inches PCCP

4 inches HMA or Lean Concrete Base

6 inches of new or existing Untreated Base Course if the vertical profile is lowered.

12 inches of new or existing Granular Borrow if the vertical profile is lowered.

(4) Local Streets:

4 inches HMA

6 inches Untreated Base Course

(5) At 5400 South provide a micro surface over asphalt full width including the full reconstruct sections to the limits of new striping.

(6) At 7000 South provide a 1.5 inch rotomill and fill with HMA over existing asphalt to the limits of new striping.

(7) At 9000 South provide a 1.5 inch rotomill and fill with HMA over existing asphalt to the limits of new striping.

(8) At 11400 South West of Bangerter provide a 1.5 inch rotomill and fill with HMA over existing asphalt to the limits of new striping.

(9) At 4015 West Build Alternative provide a micro surface over existing asphalt to the limits of new striping.

C. Overlays of existing flexible pavements are required whenever the existing pavement is widened or when new striping is required due to lane shifts and/or transitions. The overlays shall be applied to the entire width of the pavement prior to final striping to provide a continuous and homogeneous riding surface.

For the purpose of this Section 11, overlays are defined as follows:

1. Structural HMA overlays: The final full-width overlay shall include the top HMA layer and SMA wearing course.

D. Grind ~~existing~~ pavement and seal joints for all existing pavement left in place on Bangerter Highway for the following limits:

(1) 3,400 feet south of the existing northbound stop bar ~~south of~~at 9000 South to the northbound stop bar at 9000 South.

(2) 3,300 feet north of the existing southbound stop bar at ~~and~~ 11400 South to the southbound stop bar at 11400 south.

~~(1)~~(3) South of 11400 South to the north side of the 11800 south structure. ~~on Bangerter Highway, whenever existing pavement is widened or to the furthest limits of permanent striping, whichever is greater.~~

11C-1 Ride Quality

Evaluate ride quality in accordance with Standard Specification, Section 01452, and Section 8-995 (Procedure for Certifying Profilographs/Profilers and Qualifying Profilograph Technicians).

11C-2 Surface Texture

Provide longitudinal tining as defined in Standard Specification, Section 02742S.

11C-3 Temporary and/or Temporary Use Pavement

The Design-Builder shall be responsible for design, construction, and maintenance of all temporary pavements. Remove temporary pavement prior to Substantial Completion.

If existing shoulders that are to remain are used as temporary travel lanes to facilitate construction, provide in the Pavement Design Report a condition survey of the existing shoulders including photographs. The Pavement Design Report shall also include the anticipated duration for shoulder use, and demonstrate that the existing pavement is adequate to sustain the traffic loads without structural damage to the pavement. Repair or replace any damaged pavement.

11C-4 Repair of Defective Pavement

Replace any cracked, damaged, or otherwise defective pavement placed as part of the Contract or damaged by the Design-Builder. Provide new full panels for any PCCP repairs/replacement.

11C-5 Permanent Pavement Markings and Messages

For all permanent pavement markings, meet the requirements of Part 5 (Special Provisions and Exceptions).

A. Use grooved in contrasting pavement marking paint on concrete for all longitudinal lines.

B. Use pavement marking tape on asphalt surfaces for Department roads.

C. Use pavement marking paint on asphalt surfaces for City streets.

D. Use thermoplastic for all messages. Use grooved in messages on concrete.

11D. SUBMITTALS

Provide submittals to the Department in accordance with Table 11D-1.

existing barrier using required barrier transition element from 42 inch to 32 inch barrier. Remove existing median barrier from MP 11.8 to MP 12.6 and provide 42 inch cast-in-place constant-slope barrier. At MP 11.8 transition 42 inch barrier to 54 inch barrier. Connect new 42 inch barrier to existing 42 inch barrier at MP 12.6.

Provide 32-inch pre-cast concrete half barrier along the front face of the MSE walls or provide a 42-inch cast in place barrier at the edge of the pavement when the wall is inside the clear zone.

Provide 54 inch cast-in-place barrier (TL-5) around structural columns per Standard Drawing BA 1E for the Old Bingham Hwy, both UTA, and the canal structures north of 9000 South. See Appendix 2 for an approved deviation at this location removing the 4 foot separation requirement between the barrier and columns.

If existing barrier along structural columns is impacted or removed at all other locations, provide 54-inch minimum cast-in-place barrier around structural columns per Standard Drawing BA 1E. See Part 4-17 (Structures) for additional requirements.

15C-14 Curb, Curb & Gutter, and Median Curb

In locations where barrier is not installed along the edge of Bangerter Highway (SR-154) and the ramps, provide concrete curb and gutter Type M1. Extend M1 curb and gutter until it ties back to existing curb and gutter along Bangerter Highway (SR-154). Extend M1 curb and gutter along ramps up to the curb returns at the ramp terminal. Provide Concrete M1 curb and gutter at the edge of pavement along 5400 South, 7000 South, 9000 South, and 11400 South between ramps unless the street is on the structure.

Provide concrete curb Type M2 at ramp terminals for splitter islands.

Provide concrete curb Type B5 in the median along 5400 South, 7000 South, 9000 South, and 11400 South until it ties back to existing curb.

Provide back-to-back B5 curb along left turn pockets.

Provide concrete curb and gutter Type B1 along 5400 South, 7000 South, 9000 South, and 11400 South from the outside of the ramp curb returns to existing curb and gutter.

Provide concrete curb and gutter that meets the governing City for any local street that needs to be reconstructed as part of this Project.

4105 West Build Alternative: Provide concrete curb Type B5 in the median along 5400 South between 4120 West and 3900 West. Remove raised median curbs on 4015 West from Sam's Boulevard to Point Lane.

15C-15 Sidewalk and Parkstrips

Provide concrete sidewalk and/or parkstrips on any street that is being reconstructed as part of this project that currently has sidewalk and parkstrip that is being removed. Match existing widths for sidewalk and parkstrip. Replace in-kind aesthetic treatment in parkstrip areas.

Provide concrete sidewalk and a pedestrian crossing across the south side of the 7000 South interchange that ties into existing sidewalk on the east and west side. Provide width for a future sidewalk and pedestrian crossing on the north side of the 7000 South interchange between ramp intersections.

Provide pedestrian separation protection at 11400 South across the bridge as shown on Standard Drawing DD 9 for speeds less than 45 mph.

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS

PART 5:

SPECIAL PROVISIONS AND EXCEPTIONS

Addendum ~~5~~ 6 – ~~October 27~~November 3, 2016

October 24, 2016

SECTION 03251S

POST TENSIONING CONCRETE

Add Section 03251:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Post-tensioning (PT) system and grouting of prestressing steel for concrete elements.

B. Items necessary for the particular prestressing PT system used, including but not limited to ducts, anchorage assemblies, supplementary reinforcing bars, and grout used for pressure grouting ducts.

1.2 RELATED SECTIONS

A. Section 03211: Reinforcing Steel and Welded Wire

1.3 REFERENCES

A. AASHTO M 203: Steel Strand, Uncoated Seven-Wire for Concrete Reinforcement

B. AASHTO M 204: Uncoated, Stress-Relieved Steel Wire for Prestressed Concrete

C. AASHTO M 275: Uncoated High-Strength Steel Bars for Prestressed Concrete

D. AASHTO LRFD Bridge Construction Specifications, current edition

E. AASHTO LRFD Bridge Design Specifications, current edition

F. ASTM A 53: Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

G. ASTM A 240: Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and General Applications

H. ASTM A 653: Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

I. ASTM C 307: Tensile Strength of Chemical-Resistant Mortar, Grouts, and Monolithic Surfacings

J. ASTM C 531: Linear Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

K. ASTM C 579: Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

L. ASTM C 881: Epoxy-Resin-Base Bonding Systems for Concrete

M. ASTM C 882: Bond Strength of Epoxy-Resin Systems Used With Concrete by Slant Shear

N. ASTM C 1583: Tensile Strength of Concrete Surfaces and the Bond Strength or Tensile Strength of Concrete Repair and Overlay Materials by Direct Tension (Pull-Off Method)

O. ASTM D 3035: Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter

P. ASTM D 3350: Polyethylene Plastics Pipe and Fittings Materials

Q. ASTM D 3895: Oxidative-Induction Time of Polyolefins by Differential Scanning Calorimetry

R. ASTM D 4285: Indicating Oil or Water in Compressed Air

S. ASTM D 5989: Extruded and Monomer Cast Shapes Made From Nylon (PA)

T. ASTM F 593: Stainless Steel Bolts, Hex Cap Screws, and Studs

U. ASTM F 714: Polyethylene (PE) Plastic Pipe (DR-PR) Based on Outside Diameter

V. ASTM F 2136: Notched, Constant Ligament-Stress (NCLS) Test to Determine Slow-Crack-Growth Resistance of HDPE Resins or HDPE Corrugated Pipe

W. MIL-PRF-3420: Wrapping Materials, Volatile Corrosion Inhibitor Treated, Opaque

X. PTI M50.3: Post-Tensioning Institute (PTI) Guide Specification for Grouted Post-Tensioning

Y. PTI M55.1: Post-Tensioning Institute (PTI) Specification for Grouting of Post-Tensioned Structures

1.4 DEFINITIONS

A. Inlet and outlet pipes – The terms inlet pipes and outlet pipes are synonymous with vents, drains, injection, ejection, or inlet/outlet ports. Inlet and outlet pipes are devices connected to the PT system used for the injection of materials into or the ejection of materials from inside the ducts.

B. Jacking force – The force applied to the tendon before anchorage and the occurrence of losses, including the anchor set loss.

C. Permanent force – The force remaining in the prestressing steel after all losses, including long term creep and shrinkage of concrete, elastic shortening of concrete, relaxation of steel, losses in prestressing steel due to sequence of stressing, friction, unintended wobble of ducts, anchor set, friction in anchorages, and all other losses particular to the method or system of prestressing have taken place or have been provided for.

D. Torpedo – A rigid object sized to fit through undamaged post-tensioning ducts. Used to prove that installed ducts have not been blocked or damaged during the concrete pour.

E. Working Drawings – Drawings produced by the Contractor that supplement the contract drawings to provide information not included in the contract documents but that is required to fabricate, erect, transport, or temporarily support the structure or structural elements in the completion of the work.
1. Working drawings do not supersede the contract drawings.

F. Approval of Working Drawings – Acceptance by the Engineer for use on the project. The Engineer will review working drawings for general conformance with the design concept and compliance with the contract documents. Review and approval do not relieve the Contractor from responsibility for errors, correctness of details, conformance to the contract, and the successful completion of the work.

1.5 SUBMITTALS

A. Working Drawings
1. Detailed drawings of the PT system for approval. Include at least the following:
   a. Anchorage and bearing details including local zone and grillage reinforcement
   b. Duct placement including individual tendon center of gravity (CG) locations and combined tendon CG location at anchorages, low points, and high points
      1) Not required for segmental bridges or precast deck panels
      2) Distribute the prestressing force in cast-in-place post-tensioned bridge girders with approximately equal quantity in each girder and place the force symmetrically about the centerline of the structure
   c. Method and spacing of duct supports
   d. Duct ties and stirrup ties
   e. Inlet and outlet pipe locations
   f. Expected friction coefficient, wobble coefficient, and anchor set
   g. Jacking forces, jacking ends, initial stresses, and sequence
   h. Permanent grout cap detail
   i. Material data sheets for tendons, ducts, and permanent grout cap
   j. Calculated elongations and tolerances

k. Bar couplers when shown in the plans
l. High point outlet inspection details
m. Anchorage inspection details

2. Include supporting engineering calculations.
   a. Design the post-tensioning system according to AASHTO LRFD Bridge Design Specifications
   b. Include computations and a typical tendon force diagram after friction and anchor set losses based upon expected actual coefficients and values for the PT system to be used.

3. Provide detailed congestion drawings integrating PT system and concrete reinforcing at locations where duct or anchorage passes through grids of reinforcing steel, such as at anchorage zones, diaphragms, bents, and other highly congested areas.
   a. Indicate additions or rearrangement of reinforcing steel and revisions to concrete dimensions from that shown in the plans.

4. Prepare drawings according to the following:
   a. Submit drawings electronically in PDF format. Use 11 x 17 inch sheets with a 1½ inch blank margin on the left edge. Place the following information in the title block in the lower right corner of each sheet:
      1) State Project Designation
      2) State Project Name
      3) State Structure Number
      4) Contractor or Manufacturer Name
      5) Contractor or Manufacturer Drawing Number
      6) Contractor or Manufacturer Sheet Number
   b. Revise and resubmit drawings when directed by the Department.
   c. Provide the seal of a Professional Engineer (PE) or Professional Structural Engineer (SE) licensed in the State of Utah. Place the seal in the lower right corner of each sheet.

5. Prepare engineering calculations according to the following:
   a. Submit calculations electronically in PDF format. Use 8½ x 11 inch sheets with a 1-inch blank margin on the left edge or 11 x 17 inch sheets with a 1½ inch blank margin on the left edge. Title block location is at the top of 8½ x 11 inch sheets or the lower right corner of 11 x 17 inch sheets. Place the following information in the title block:
      1) State Project Designation
      2) State Project Name
      3) State Structure Number
      4) Contractor or Manufacturer Name
      5) Contractor or Manufacturer Drawing Number
      6) Contractor or Manufacturer Sheet Number
   b. Provide the seal of a PE or SE licensed in the State of Utah on engineering calculations. Place the seal on the calculation cover sheet.
   c. Certify that engineering calculations have been checked according to the UDOT Structures QC/QA Procedures.

6. Allow the Engineer 14 calendar days to review and approve working drawings and supporting calculations.

a. The Engineer may grant an increase in the number of working days for the project when that time is exceeded.
b. This review period applies each time the drawings and calculations are submitted.

7. Do not begin work until receiving approval of the working drawings.
8. Do not deviate from the approved drawings unless authorized in writing by the Engineer. Assume the responsibility for costs incurred due to faulty detailing.

B. Personnel Qualifications

1. Provide names and current certifications of qualified supervisors for information.
   a. Refer to this Section, article 1.6

C. Grouting Procedures and Safety Procedures

1. Submit grouting procedures at least 45 calendar days in advance of scheduled grouting operations for approval.
   a. Include the following:
      1) Names, proof of training and experience records for the grouting crew and the crew supervisor in conformance with this Section
      2) Type, quantity, brand, and certifications for materials used in grouting, include product data sheets
      3) Equipment data, including capacity in relation to demand, as well as provisions for back-up equipment
      4) General grouting procedure
      5) Duct cleaning procedure
      6) Duct pressure test and repair procedure.
      7) Mixing and pumping procedure
      8) Method to be used to control the rate of flow within ducts
      9) Theoretical grout volume calculations
      10) Direction of grouting and sequence of inlet and outlet pipe usage
      11) Procedures for handling blockages and potential regrouting and post grouting repair.
2. Submit safety procedures for information.
3. Allow the Engineer 14 calendar days to review and approve grouting procedures and safety procedures.
   a. The Engineer may grant an increase in the number of working days for the project when that time is exceeded.
   b. This review period applies each time the procedures are submitted.
   c. Do not begin work until receiving approval of the grouting procedures and safety procedures.

D. Prestressing Steel

1. Accompany each lot of prestressing steel with a mill certificate and a test report including the following:
   a. Chemical composition (not required for strand)
   b. Cross-sectional area
   c. Yield and ultimate strengths

d. Elongation at rupture
e. Modulus of elasticity
f. Stress strain curve for the actual prestressing steel intended for use

2. Supply a certificate of conformance stating the manufacturer's minimum guaranteed ultimate tensile strengths and actual ultimate strengths with each reel or heat of prestressing steel wires, bars, or strands. Refer to this Section, article 2.2.
3. Samples for prestressing steel testing
   a. Provide samples to the Department for verification testing from each manufactured reel of prestressing steel strand, from each size and each heat of prestressing bars, from each coil of prestressing wire, and from each lot of anchorage assemblies and bar couplers to be used.
      1) Provide three 5 ft long samples of each size from each reel for strand.
      2) Provide three 7 ft long samples from each heat or reel for wire or bars.
   b. Deliver samples with a transmittal form to location determined by the Engineer.
   c. Allow seven calendar days for the Department to test the samples.

E. Post-Tensioning Anchorages
1. Submit a test report and certificate of conformance provided by an independent testing laboratory for approval which indicates that the anchorages meet the testing requirements in Section 10.3.2.3 of the AASHTO LRFD Bridge Construction Specifications.
   a. Indicate that anchorages satisfy the requirements stated in this Section, article 2.3 A.
2. Allow the Engineer 14 calendar days to review and approve the report and certificate.
   a. The Engineer may grant an increase in the number of working days for the project when that time is exceeded.
   b. This review period applies each time the report and certificate are submitted.
   c. Do not begin work until receiving approval of the test report and certificate of conformance.

F. Stressing Jacks
1. Refer to this Section, article 3.4 B.
2. Furnish calibration charts certified by an independent laboratory with each jack and associated gauge or load cell used on the project.
   a. Calibrate jack and its gauge or load cell as a unit with the cylinder extension in the approximate position that it will be at final jacking force.
   b. Provide certification for accuracy of the jack and associated gauge or load cell at the start of the work, after repair or adjustment, and every 180 days thereafter or as requested by the Department.
   c. Provide pressure gauge calibration charts that are done while the jack is in the identical configuration as will be used on site including same length of hydraulic lines.

G. Duct Pressure Field Test Records
1. Submit a copy of the duct pressure field test records specified in this Section, article 3.3 B for information within five calendar days of completing tests.

H. Elongation Records Record elongations of each tendon at time of stressing along with jacking force and target elongation. Refer to this Section, article 3.4.
1. Submit record of elongation of each tendon at time of stressing along with jacking force, gauge pressure, and target elongation for information within five calendar days of completed tendon installation. Refer to this Section, article 3.4 D.

I. Stressing Operation Records
1. Submit a copy of the stressing operation records specified in this Section, article 3.4 A5 for information within five calendar days after completion of stressing operations.

J. Post-Tensioning Grout Test Reports
1. Submit certified test reports for approval from an independent Laboratory, Cement Concrete Reference Laboratory (CCRL) approved, which show that the post-tensioning grout material meets the requirements specified in this Section, article 2.6.
2. Allow the Engineer 14 calendar days to review and approve grout test reports.
   a. The Engineer may grant an increase in the number of working days for the project when that time is exceeded.
   b. This review period applies each time the procedures are submitted.

K. Grouting Operation Reports
1. Submit for information:
   a. Progress of grouting operations for each duct signed by grouting operation supervisor in control of the work for information within five calendar days after grouting
   b. Information per duct indicating dates of tendon installation and grouting
   c. Copy of the grouting operation records specified in this Section, article 3.5 E11

1.6 SUPERVISOR REQUIREMENTS

A. PT system manufacturer's representative must:
1. Be certified as a PTI Level 2 Bonded PT Field Specialist
2. Attend the preconstruction meeting
3. Be present at all times during installation of PT system components to:
   a. Inspect and approve installation of hardware, including ducts
   b. Provide instructions to the Contractor regarding concrete placement around the ducts, end-anchorage assemblies, and other appurtenances
4. Provide close observation and control of:

a. Duct pressure field test
b. Stressing and anchoring of tendons
c. Post-grout inspections and repairs
d. Record keeping, certification of stressing results, and approval of elongations

5. Be present for grouting operations
6. Review and sign:
   a. Duct pressure field tests records
   b. Elongation records
   c. Stressing operation records
7. More than one representative is required when multiple PT operations are occurring simultaneously.

B. Grouting operation supervisor must:
1. Be certified as either an ASBI Certified Grouting Technician or a PTI Level 2 Bonded PT Field Specialist
2. Attend the preconstruction meeting
3. Provide close observation and control of grouting operations, including:
a. Mixing and placing
b. Field trial tests
c. Field mockup tests
d. Production tests
4. Review and sign:
a. Grouting Procedures
b. Safety Procedures
c. Grouting operation reports

PART 2 PRODUCTS

2.1 GENERAL

A. Store materials in a weatherproof building, shed, covering, or container until time of use.

B. Equipment for oil-free and water-free compressed air.
1. Refer to ASTM D 4285.

2.2 PRESTRESSING STEEL

A. Materials:
1. Strand
   a. Uncoated, Grade 270, low-relaxation, 7-wire strand conforming to AASHTO M 203
2. Bar
   a. Uncoated deformed (Type II) conforming to AASHTO M 275
3. Wire
   a. Uncoated, low-relaxation conforming to AASHTO M 204

B. Attach tags for strand from each manufactured reel, bars of each size from each mill heat, wire from each coil, anchorage assemblies, PT system components and bar couplers to be shipped to the site.
1. Assign the individual lot number and tag in such a manner that each lot can be accurately identified at the job site.
2. Unidentified prestressing steel, anchorage assemblies, or bar couplers received at the site will be rejected if there is a loss of positive identification of these items at any time.

C. Use bar couplers only at the locations shown in the plans.
1. Use mechanical couplers that develop at least 96 percent of the actual ultimate strength of the bar, tested in an unbonded state, without exceeding anticipated set.
2. Use couplers for bars that do not reduce the elongation at rupture below the anticipated elongation of an uncoupled bar.

D. Protect prestressing steel against physical damage and rust or other results of corrosion at all times from manufacture to grouting or encasing in concrete.
1. Do not use prestressing steel that has sustained physical damage.
2. Remove and discard lengths of strand containing broken wire.
3. Use wire that is bright and uniformly colored, having no foreign matter or pitting on its surface.
4. Package prestressing steel in containers or shipping forms to protect the steel against physical damage and corrosion during shipping and storage.
   a. Use a corrosion inhibitor which prevents rust or other results of corrosion, placed in the package or form,
      1) Use a corrosion inhibitor either placed in the package form, or applied directly to the steel that has no deleterious effect on the steel, grout, concrete or bond strength of steel to grout.
      2) Use inhibitor carrier type packaging material that conforms to the provisions of Federal Specification MIL-PRF-3420.
   b. Immediately rejuvenate or replace the corrosion inhibitor if its useful life expires.
5. Use shipping package or form that is clearly marked with a statement that the package contains high-strength prestressing steel, care to be used in handling, the type, kind, and amount of corrosion inhibitor used including the date when placed, safety orders, and instructions for use.
   a. Immediately replace damaged packaging or forms or restore to original condition.

2.3 POST-TENSIONING ANCHORAGES

A. Use anchoring devices that develop at least 96 percent of the actual ultimate tensile strength of the prestressing steel, tested in an unbonded state, without exceeding the anticipated set.

2.4 DUCTS

A. General

1. Use corrugated galvanized metal ducts, corrugated plastic ducts, rigid steel pipe ducts or smooth plastic ducts.
   a. Use ducts that are mortar tight, and capable of withstanding concrete pressures without deforming or permitting the entrance of cement paste during the placing of concrete.
   b. Use ducts that can be accurately bent and placed at the locations shown in the plans.
2. Minimum internal dimensions for:
   a. Multi-strand tendons: cross-sectional area 2½ times the cross-sectional area of the prestressing steel
   b. Prestressing bars: diameter ½ inches larger than bar outside diameter, measured across deformations
   c. Prestressing bars with couplers: diameter ½ inches larger than largest dimension of the largest enclosed element
      1) Enclose bar couplers and coupler components in housings long enough to permit the necessary movements
3. Use ducts that have properties compatible with the assumed design values shown in the plans.
4. Use ducts that can be bent as shown in the plans without crimping or flattening and have sufficient strength to maintain their correct alignment during placing of concrete.
5. Use duct splices at joints between precast segments that are capable of positively preventing the entrance of cement paste and water from concrete.
   a. Use duct splices that do not cause electrolytic action or deteriorate.
6. Provide reference marks on rigid ducts to facilitate orientation during placement.
7. Provide hold down ties to the forms when the buoyancy of the ducts in the fluid concrete would lift the reinforcing steel.

B. Metal Ducts:
1. Fabricate corrugated semi-rigid ducts from ASTM A 653 galvanized sheet steel, coating designation G90.
   a. Use a minimum wall thickness of:
      1) 26 gauge for semi-rigid ducts less than or equal to 2.625 inches in diameter
      2) 24 gauge for semi-rigid ducts greater than 2.625 inches in diameter
      3) 31 gauge when bar tendons are preassembled with semi-rigid ducts
   b. Fabricate with either welded or interlocked seams.
      1) Galvanize welded seams.
2. Fabricate rigid steel pipe ducts from galvanized ASTM A 53 Grade B schedule 40 steel pipe.
   a. Use pipe with smooth inner walls capable of being curved to the proper configuration without crimping or flattening.
3. Provide joints between sections of ducts that have positive metallic connections which do not result in angle changes at the joints.

C. Plastic Ducts
1. Refer to Section 10.8.3 of the AASHTO LRFD Bridge Construction Specifications for the fabrication and testing requirements of corrugated plastic ducts.
a. Use seamless fabrication methods to manufacture corrugated plastic duct.
2. Use rigid smooth black polyethylene ducts manufactured from 100 percent virgin polyethylene resin meeting the requirements of ASTM D 3350 with a minimum cell class of 445574C where the tendon is not embedded in concrete.
a. Use a resin containing antioxidant(s) with a minimum oxidation induction time (OIT) according to ASTM D 3895 of not less than 40 minutes.
b. Manufacture smooth duct with a dimensional ratio (D/R) of 17.0 as established by either ASTM D 3035 or ASTM F 714 as appropriate for the manufacturing process used.
c. Use duct meeting the minimum pressure rating of 100 psi.

D. Exceptions
1. Use plastic ducts that are leak tight, vapor tight and impermeable where special corrosion protection is required, such as in bridge decks, external tendons, and bridge elements subjected to corrosive environments.
2. Use plastic ducts where stray electrical currents may cause corrosion damage to tendon materials.
3. Do not use plastic ducts when the radius of curvature of the tendon is less than 30 ft.

E. Splices, Joints, Couplings, Connections, and Inlet and Outlet Pipes
1. Use stainless steel, nylon, or polyolefin materials.
a. Stainless steel products other than bolts, conform to ASTM A 240 Type 316.
1) ASTM F 593 Type 316 for bolts
b. Nylon products, use one of the following cell classes according to ASTM D 5989:
1) S-PA0141 (weather resistant)
2) S-PA-0231 (heat stabilized)
3) S-PA0401 (ultimate strength not less than 10,000 psi with UV stabilizers added)
c. Polyolefin products, conform to the following:
1) Contains antioxidants with a minimum induction time of 20 minutes according to ASTM D 3895
2) Remolded finished polyolefin material has a stress crack resistance minimum failure time of 3 hours at an applied stress of 348 psi using ASTM F 2136
2. Make splices, joints, couplings, and connection to duct and anchorage with devices or methods (mechanical couplers, plastic sleeves, heat-shrink sleeves) producing a smooth interior alignment with no lips or kinks.
a. Provide connections and fittings that are airtight and watertight.
b. Tape sealed connections or repairs are not permitted

c. Heat-shrink sleeves requirements, refer to PTI M50.3, Section 4.3.7.
d. Provide connections that are external to the concrete with a minimum pressure rating of 100 psi.

3. Plastic components, including fasteners, must be free of water soluble chlorides and not react with the concrete or enhance corrosion of the prestressing steel.
4. Use inlet and outlet pipes that are ¾ inch minimum inside diameter for strand tendons, or ⅜ inch for single bar tendons.
   a. Use inlet and outlet pipes that are fitted with positive mechanical shut-off valves or plugs.
      1) Design and test inlets, outlets, valves, and plugs to resist a minimum pressure of 150 psi.
   b. Extend pipes a sufficient distance out of the concrete member to allow for proper closing of the valves

2.5 REINFORCING STEEL

A. Use coated reinforcing steel according to Section 03211.

2.6 PT GROUT

A. Use a commercial, prepackaged, anti-bleed, post-tensioning grout conforming to the requirements for a Class C grout as defined by PTI M55.1.
   1. Furnish grout capable of meeting the vertical rise requirements for the project tendons.
   2. Deliver grout in plastic lined or coated moisture proof containers, stamped with the application type, date of manufacture, lot number and mixing and pumping instructions.
      a. Use grout within 6 months of manufacture.
   3. Use water that is potable, clean, and free of injurious quantities of substances known to be harmful to Portland cement or prestressing steel.

2.7 EPOXY GROUT

1. Refer to Table 1 for properties

Table 1

Epoxy Grout Properties		
Property	**Test Method**	**Requirements**
Compressive Strength (7 day)	ASTM C 579 Method B, 2 inch cubes, Load Rate II	> 10,000 psi
Tensile Strength (7 day)	ASTM C 307	> 2,000 psi
Slant Shear Bond Strength	ASTM C 882	> 1,500 psi
Linear Shrinkage	ASTM C 531	0.025%

2.8 PERMANENT GROUT CAP

A. Use permanent grout caps made of one of the following:
   1. Fiber reinforced polymers using nylon, Acrylonitrile Butadiene Styrene (ABS), or polyester resinsa. Products made from nylon, use one of the following cell classes:
      1) S-PA0401 (weather resistant)
      2) S-PA0231
      3) S-PA0401 (ultimate strength not less than 10,000 psi with ultraviolet stabilizer added) according to ASTM D 5989
   2. ASTM A 240 Type 316L stainless steel

B. Use caps rated for a minimum pressure of 150 psi.

C. Seal caps against the anchor bearing plate with neoprene “O”-ring seals and ASTM F 593 Type 316 stainless steel bolts.

D. Provide an inlet port at the top of the cap or front of cap as appropriate.

2.9 EPOXY COMPOUND

A. Comply with ASTM C 881 Type IV.

PART 3 EXECUTION

3.1 ANCHORAGE INSTALLATION

A. Arrange the anchorage so that the prestressing force in the tendon can be verified before removal of the stressing equipment.

B. Set anchorage devices or block-out templates for anchorages in a plane normal to the axis of the tendons so that anchor plates are normal in all directions of the tendon and bear uniformly on the concrete.

C. Recess the anchoring devices so that the ends of the prestressing steel and parts of anchoring devices including permanent grout caps are embedded at least 2 inches inside the end surface of the element.

D. Locate anchorages within plus or minus ¼ inch of the desired position laterally and plus or minus 1 inch along the tendon.
1. Maintain minimum cover requirements.

E. Verify entrance and exit angles of tendon paths at anchorages and at faces of concrete so they are within plus or minus 3 degrees of desired angle measured in any direction, and deviations in the alignment are accomplished with smooth transitions without kinks.

3.2 DUCT INSTALLATION

A. Securely tie ducts in position, inspect, and repair before concrete placement is started. Use supplementary support bars where needed to maintain proper alignment of the duct.

B. Securely fasten internal ducts to avoid displacing or damaging the ducts during concrete placement.
1. Support polyethylene duct and metal duct for longitudinal PT in the flanges at intervals not to exceed 2 ft.
2. Tie polyethylene duct in webs for longitudinal PT to stirrups at intervals not to exceed 2ft.
3. Support flat ducts for transverse PT at intervals of not more than 12 inches.
4. Tie metal duct for longitudinal PT in webs to stirrups at intervals not to exceed 4 ft.

C. Verify final position of PT duct is within the tolerances shown in Table 10.4.1.1-1 of the AASHTO LRFD Construction Specifications.
1. Position the duct as shown in the plans and adjust the reinforcement as determined by the Engineer if conflicts exist between the reinforcement and post-tensioning duct.

D. Provide inlet/outlet ports at the following locations:
1. Anchorage areas of tendon
2. The high points of the duct, when there is more than a 20 inch variation in the vertical position of the duct
   a. Locate additional outlet ports 3 ft to either side of the high point
3. Low points of the duct. Verify outlet port is free draining
4. Major changes in the cross section of the duct, such as coupler locations
5. Locations as shown in the plans

E. Verify that ducts, anchorage blockouts, openings, inlets, and outlets are kept clean and free of debris, fuel, oils, other contaminants, and site trash.

1. Seal the ends of ducts after installation in the forms.
2. Leave low point outlets open.

F. Verify angle changes at duct joints are within plus or minus 3 degrees of desired angle measured in any direction, and deviations in the alignment are accomplished with smooth transitions without kinks.

G. Use mandrels as stiffeners in each duct during concrete placement for precast segments.
1. Extend mandrel throughout the length of the segment being cast and at least 2 ft into the corresponding duct of the previously cast segment.
2. Provide mandrels of sufficient rigidity to maintain the duct geometry with the tolerances shown in this Section.

3.3 TENDON INSTALLATION

A. Verify that ducts are unobstructed, undamaged, and free of water and debris after completion of concrete placement and before installing the prestressing steel.
1. Prove that the ducts are clear of obstructions or damage by passing a suitably sized torpedo through the ducts.
   a. Size the torpedo ¼ inch smaller than the clear, inside dimensions of the duct, with rounded ends.
   b. Use a 2 ft long torpedo for straight ducts.
   c. Size the torpedo, for sharply curved ducts, such that when both ends touch the outermost wall, the torpedo is at least ¼ inch clear of the inside wall.
   d. The member will be rejected if the torpedo will not easily travel completely through the duct.
   e. Using a torpedo to verify that ducts are clear is not required for four strand tendons in flat ducts used for transverse PT of segmental box-girders placed before concrete casting.
      1) Prove PT ducts are free and clear of obstructions or damage by moving the group of strands back and forth in duct for a minimum distance of 1 ft in each direction.
      2) Move strands easily, by hand, without resorting to excessive effort or mechanical assistance.
2. Flush ducts with oil-free and water-free compressed air or water as required to remove unwanted material from inside of ducts.
   a. Ducts subjected to contamination with chlorides, water used for flushing ducts may contain slack lime (calcium hydroxide) or quicklime (calcium oxide) in the amount of 0.1 lb/gal.
      1) Test for presence of chlorides and oils in discharged water before placing tendons.
      2) Continue to flush if chloride levels in flush water outflow exceeded 300 ppm until chloride level in flush water outflow is below 250 ppm.
   b. Blow all water out of the duct with oil-free compressed air and swab dry after flushing.

B. Conduct duct pressure field tests before installing the internal or external prestressing steel.
   1. Install grout caps, inlet and outlet port caps, and other components necessary to seal ducts.
   2. Pressurize duct to 50 psi using oil-free and water-free compressed air.
      a. Only one duct per web or girder may be tested at a time.
   3. Lock off the outside air source.
   4. Record pressure loss for 1 minute.
      a. Locate the leak, repair, and retest if the pressure loss exceeds 15.0 psi for tendons greater than 150 ft long, or 25.0 psi for tendons less than or equal to 150 ft long.
   5. Include location and method of repair in duct air test records if repairs are required.
   6. Do not load strand until all pressure tests are successful.

C. Strands in an individual tendon may be pushed or pulled through the duct individually, or may be pulled through the duct as a unit.
   1. Protect the strand which is being advanced into the duct from contact with abrasive materials such as steel or concrete and contaminants such as grease, oil, and dirt at all times.
      a. Round off ends of strands and wires that are pushed, or fit advancing end with smooth protective cap.
      b. Use pulling lines with a capacity of at least 2.5 times the dead weight of the tendons when used for essentially horizontal tendon installation.
      c. Do not use pushing wheels made from metal.
      d. Do not intentionally rotate strands or wires during installation.
      e. Use a special steel wire sock or other device attached to advancing end if a tendon is pulled through the duct.
      f. Do not install permanent tendons before completion of testing as required by this Section.

3.4 STRESSING TENDONS

A. General
   1. Do not apply PT forces until the concrete has attained the required compressive strength as shown in the plans.
      a. Do not apply PT forces to cast-in-place concrete structures other than segmentally constructed bridges until 10 days after the last concrete has been placed in the member.
      b. Make test cylinders for determining strength of the same concrete and cured under the same conditions as the member.
   2. Stress all strands in each tendon simultaneously with a multi-strand jack except for those in flat ducts with not more than four strands.
   3. Furnish equipment for tensioning the tendons from the manufacturer of the PT system.
   4. Sequence the stressing of post-tension cast-in-place bridge such that no more than one tendon is stressed per web before stressing a tendon in another web.

a. Do not apply an eccentric force about the centerline of the structure that exceeds $^1/_6$ of the total post-tensioning force at any time during the prestressing.

5. Keep stressing operation records that include the following for each tendon installed:
   a. Project Pin, Name, and number
   b. Contractor and subcontractor
   c. Tendon location, size and type
   d. Date tendon was first installed in ducts
   e. Coil and reel number for strands or wires and heat number for bars and wire
   f. Assumed and actual cross-sectional area
   g. Assumed and actual modulus of elasticity
   h. Date stressed
   i. Jack and gauge numbers per end of tendon
   j. Required jacking force
   k. Gauge pressures
   l. Elongations (theoretical and actual)
   m. Anchor sets (theoretical and actual)
   n. Stressing sequence (for example tendons before and after this tendon)
   o. Stressing mode (one end or two ends or simultaneous)
   p. Witnesses to stressing operation (Contractor, manufacturer's representative, and Inspector)
   q. Date grouted, days from stressing to grouting, grouting pressure applied, and injection end
   r. Other relevant information

B. Stressing Jacks
1. Use hydraulic jacks to stress tendons that are capable of providing and sustaining the necessary forces. Equip each jack with either:
   a. A pressure gauge with an accurately reading dial at least 6 inches in diameter.
   b. A load cell with indicator by means of which the prestressing force in the tendon may be determined.
      1) Do not use the lower 10 percent of the Manufacturer's rated capacity when determining the jacking stress.
2. Use a jacking system that provides an independent means of measuring the tendon elongation.

C. Tensioning Operations
1. Tension prestressing steel so that the force of the prestressing steel will not be less than the value shown on the authorized shop drawings.
   a. Do not exceed 80 percent of the guaranteed ultimate tensile strength of the prestressing steel during the stressing of the tendons.
      1) Replace tendons stressed past 80 percent of the guaranteed ultimate tensile strength.
   b. Anchor the prestressing steel at initial stresses that will result in the long term retention of permanent forces of not less than those shown on the approved shop drawings.

c. Do not allow the initial stress at the anchorage to exceed 70 percent of guaranteed ultimate tensile strength after anchor set.

2. Remove and replace strand due to wire failure or slipping during stressing if any of the following conditions are met:
   a. Member cross section has a final effective PT force less than 98 percent of the design total PT force based on the recorded jacking force or liftoff force, whichever is smaller.
   b. PT force across a mating joint is less than 98 percent of PT force required by the contract drawings for that mating joint for that stage of construction.
      1) This requirement applies to segmental construction, or similar construction that has members post-tensioned together across a common joint face at any stage of construction.
   c. Any single tendon has more than a 5 percent reduction in cross-sectional area or post-tensioning steel due to wire failure.
3. Follow stressing sequence shown in authorized shop drawings.

D. Elongations
1. Conduct the tensioning process such that tension being applied and the elongation of the post-tensioning steel can be measured at all times.
2. Keep a permanent record of gauge pressures and tendon elongations for each tendon.
3. Measure elongations to the nearest $^{1}/_{16}$ inch.
4. Preload tendons to 20 percent of their final jacking force before beginning elongation readings to eliminate take-up in the tensioning system.
5. Mark each strand before final stressing to permit measurement of elongation and to verify that all anchor wedges set properly.
6. The measured elongation must agree within 7 percent of the theoretical elongation for the post-tensioned elements to verify the required tendon force, or the entire operation must be checked and the source of the error determined and remedied to the satisfaction of the Department before proceeding with the work.
   a. Do not overstress the tendon to achieve the theoretical elongation.
   b. Acceptance may be achieved by force verification lift-off tests demonstrating that the measured force is within minus 1 percent and plus 5 percent of the required force as shown in the plans if the measured elongations fall outside of the acceptable tolerance.
7. Do not cut off the stressing tails of the tendons until the elongations have been approved by the PT system manufacturer's representative. Within 4 hours of approval:
   a. Cut prestressing steel using an abrasive saw or plasma torch to within ¾ inch to 1½ inch from anchorage.
      1) Flame cutting of PT steel is not permitted.
   b. Clean rust and other debris from metal surfaces which will be covered by the grout cap
   c. Place grout cap, including a seal, over the wedge place until the tendon is grouted.

E. Protection of Steel After Installation

1. Minor rust which may form on the surface of the prestressing steel within 10 calendar days after protective packaging has been opened will not be cause for rejection.
2. Prestressing steel installed, tensioned, and grouted within 10 calendar days will not require the use of corrosion inhibitor in the duct following installation of the prestressing steel.
    a. Blow a vapor phase corrosion inhibitor powder conforming to MIL-PRF-3420 into ducts containing prestressing steel if prestressing steel is anticipated to be removed from protective packaging for 10 days or more before grouting.
3. Do not exceed 15 calendar days between removal of prestressing steel from protective packaging and grouting operations.
    a. Failure to begin grouting operations will result in stoppage of work.

3.5 GROUTING

A. General
1. Begin grouting operations to fill the void space between the duct and the tendons as soon as possible after all the prestressing steel has been tensioned, anchored and approved by the PT system manufacturer's representative.
2. Flush the inside of the duct with water under pressure to remove all traces of the corrosion inhibitor used to protect the prestressing steel if a vapor phase corrosion inhibitor has been blown into ducts before grouting.
    a. Continue flushing operations until the discharge water is free of traces of the corrosion inhibitor.
    b. Blow all water out of the duct with oil-free compressed air and swab dry after flushing.
3. Eliminate vibration from all sources under the contractor's control within 300 ft of the member being grouted for the duration of the grouting procedure and 4 hours after completion.
4. Conduct a joint meeting of the Contractor, grouting crew and the Engineer before grouting operations begin.
    a. Discuss the grouting operation plan, required testing, corrective procedures, and other relevant issues at the meeting.

B. Temperature considerations
1. Keep PT grout below 90 degrees F during mixing or pumping.
    a. Cool the mixing water if necessary.
2. Keep ducts free of water to avoid damage due to freezing in temperatures below 32 degrees F.
3. Keep accurate temperature records covering maximum and minimum air temperatures, and temperatures of the concrete adjacent to the ducts to be grouted when ambient temperature may be expected to fall below 40 degrees F.
4. No materials in which frost or ice is present are to be used, and keep the ducts and equipment free of frost and ice.
5. Postpone grouting operations if frost is expected within 48 hours of start.
6. Maintain a temperature of at least 35 degrees in the grout in the ducts for the duration of the grouting and the longer of 72 hours after completion or

until job-cured 2 inch cubes of PT grout reach a minimum compressive strength of 800 psi when low temperatures are expected and grouting cannot be postponed.

C. Equipment
1. Use equipment which meets the requirements in Section 10.11.3 of the AASHTO LRFD Bridge Construction Specifications.
2. Provide flushing equipment with an independent power source on site, capable of developing a pressure of 250 psi and of sufficient capacity to flush out partially grouted ducts as required due to blockage or breakdown of equipment.
   a. Do not exceed the allowable grouting pressures when flushing. Refer to this Section, article 3.5 E7.

D. Mixing
1. Mix PT grout according to the manufacturer's recommendations.
   a. Continue mixing grout until a uniform, thoroughly blended grout is obtained, without excessive temperature increase.
2. Agitate the grout continuously until it is pumped.
3. Do not begin grouting operations until the field trial tests specified in PTI M55.1, Section 4.7.1 have been satisfactorily performed.
   a. Do not add water to increase grout flowability that has been decreased by delayed use of the grout.
4. Perform field mockup test specified in PTI M55.1, Section 4.7.2, when required by the Engineer.
5. Do not exceed a water-cement ratio of 0.45.

E. Grouting Operations
1. Blow oil-free and water-free compressed air through the ducts checking all inlet and outlet pipes to verify they are capable of accepting injection of the PT grout immediately before grouting.
2. Open all inlet and outlet ports before grouting starts.
3. Obtain target flow rates as a function of mixer type used and ambient temperatures from the PT grout manufacturer.
   a. Verify the grouting rate is slow enough to avoid air entrapment and segregation of the grout and verify complete filling of the duct.
4. Maintain a continuous, one-way flow of PT grout in a generally uphill direction.
   a. Inject PT grout from near the lowest end of tendons.
   b. Grout each tendon in one operation.
   c. Flush the grout out of the duct with water immediately when one-way flow of grout cannot be maintained or grouting is interrupted.
5. Refer to PTI M55.1, Section 4.7.3 for production test requirements of production grout.
6. Perform normal operations at approximately 75 psi.
7. Do not exceed a pumping pressure at the tendon inlet of:
   a. 145 psi for internal polyethylene ducts
   b. 245 psi for internal circular steel ducts
   c. 145 psi for external HDPE pipe
   d. Close the inlet and inject the PT grout at the next outlet (which now becomes an inlet) which has just been, or is ready to be

closed, as long as a one-way flow is maintained if the actual grouting pressure exceeds the maximum allowed.
1) Fit the outlet that is to be used for injection with a positive shutoff.
2) Do not inject grout into a succeeding outlet from which grout has not yet flowed.

8. Waste grout through the first outlet after the inlet pipe until residual water or entrapped air has been removed,
   a. Cap or otherwise close outlet when the consistency of the ejected grout is the same as the injected grout.
   b. Close following remaining outlets in the same manner, except at high points where the outlets a short distance downstream to the high point are closed before the high point outlet.
   c. Discharge at least 2 gallons of grout through the final outlet pipe before sealing.
9. Provide a standpipe at the upper end of the duct for vertical or nearly vertical tendons.
   a. Design the standpipe to collect and store bleed water and allow it to be removed from the grout.
   b. Locate the standpipe so that the level of the grout can be brought to an elevation so that bleeding will not cause the level of the grout to drop below the highest point of the upper anchorage device.
   c. Remove the standpipe after the grout has hardened.
10. Do not remove or open plugs, caps, or valves until the PT grout has set.
   a. Remove ends of inlet/outlet pipes at least 2 inches below the concrete surface after the grout has set.
   b. Fill the void with epoxy grout within 4 hours of inlet and outlet removal.
   c. Remove all miscellaneous material used for sealing grout caps before carrying our further work to protect anchorages.
   d. Permanently seal all outlet and inlet openings for external tendons.
11. Keep grouting operation records that include the following for each duct:
   a. Names of personnel performing the grouting activity
   b. Identification of tendon
   c. Date grouted
   d. Number of days from tendon installation to grouting
   e. Quantities and types of material used
   f. The maximum pumping pressure at the inlet
   g. Temperature measurements of air, water, prepackaged material, mixture grout, and concrete member in the duct
      1) Note if temperatures are within acceptable limits.
   h. Summary of tests performed and the results, including post-grouting inspection
   i. Volume of grout pumped and capacity of duct accounting for reduction for area of prestressing steel
      1) Include ratio of actual grout used to anticipated quantity of grout used.
   j. Time from beginning grouting operation to sealing all inlet and outlet pipes

k. Discussions of problems encountered during grouting and steps taken to resolve them

F. Post-Grouting Inspection
1. Randomly inspect 10 percent of the inlet and outlet pipes at anchorage and at high points for voids by drilling and inspecting with a borescope.
a. Inspect ducts between 24 and 72 hours after grouting.
b. Use drilling equipment that will automatically shut off when steel is encountered to prevent damaging the prestressing steel and anchorages.
c. All anchorages and high points will be inspected if a void exposing prestressing steel is found by random drilling.
d. Fill drilled holes not indicating voids with epoxy compound within 4 hours of completion of inspections.
1) Use an injection tube to fill drilled hole from the base.
e. Use vacuum grouting to fill voids that expose prestressing steel.
1) Perform vacuum grouting operations under the direct supervision of a crew foreman who has been trained and has experience in the use of vacuum grouting equipment and procedures.

3.6 PROTECTION OF END ANCHORAGE

A. Protect PT strand, wire, and bar anchorages as soon as practical, but not to exceed 10 days after grouting is completed.
B. Cap inlets and outlets with plastic or stainless steel threaded plugs.

C. Construct anchorage pour-backs with epoxy grout according to manufacturer's recommendations.
1. Mechanically clean and abrasive blast clean the surface of concrete in anchorage recesses until clean aggregate is exposed.
a) Flush surface with water and blow dry.
2. Do not damage reinforcing steel coatings.
3. Test substrate at pour-back locations using ASTM C 1583 and develop a minimum of 175 psi tension.
D. Construct pour-backs using tight fitting forms that can be installed and held in place securely against the previously placed concrete.
1. Fill recess with epoxy grout and finish flush.

END OF SECTION

October 24, 2016

SECTION 03372S

THIN BONDED POLYMER OVERLAY

Delete Section 03372 and replace with the following:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Thin bonded polymer overlay system applied to concrete bridge decks and approach slabs.

B. Removal of existing polymer overlay from concrete bridge decks and approach slabs.

C. Repair of damaged areas of a polymer overlay system.

1.2 RELATED SECTIONS Not Used

1.3 REFERENCES

A. ASTM C 25: Chemical Analysis of Limestone, Quicklime, and Hydrated Lime

B. ASTM C 88: Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

C. ASTM C 131: Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

D. ASTM C 566: Total Evaporable Moisture Content of Aggregate by Drying

E. ASTM C 579: Compressive Strength of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes

F. ASTM C 881: Epoxy-Resin-Base Bonding Systems for Concrete

G. ASTM D 570: Water Absorption of Plastics

H. ASTM D 638: Tensile Properties of Plastics

I. ASTM D 790: Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials

J. ASTM D 2240: Rubber Property – Durometer Hardness

K. ASTM D 4285: Indicating Oil or Water in Compressed Air

L. ASTM D 4580: Measuring Delaminations in Concrete Bridge Decks by Sounding

M. ASTM D 5821: Determining the Percentage of Fractured Particles in Coarse Aggregate

N. ASTM D 6928: Resistance of Coarse Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus

O. ASTM E 274: Skid Resistance of Paved Surfaces Using a Full-Scale Tire

P. American Concrete Institute (ACI)

Q. International Concrete Repair Institute (ICRI)

1.4 DEFINITIONS

A. Polymer Overlay System – A thin bonded polymer overlay applied as a wearing surface consisting of a two-part polymer resin broadcasted with aggregate to refusal before it cures.

B. Installer – The entity preparing the surface and installing and finishing the polymer overlay system.

C. Provider – The manufacturer furnishing the polymer overlay system.

1.5 SUBMITTALS

A. Provider Qualifications for review at least 10 calendar days before ordering material.
   1. Include at least the following:
      a. Company name.
      b. Name and phone number of the Provider's Technical Support Representative.
      c. List of projects using the submitted products with at least two years of satisfactory performance under similar environmental conditions as the project in which it is to be applied. Refer to this Section, Article 1.6 B. List the following for each project:
         1) Project name
         2) Bridge locations (state routes and bridge identifiers)
         3) Scope of work
         4) Products used
         5) Approximate date of the system opening to traffic.

B. Materials
   1. The following information at least 10 calendar days before ordering material:
      a. Manufacturer's Product Data Sheets and recommended installation instructions.
      b. Material Safety Data Sheets.

c. The Provider's certification stating that the provider is the sole provider of the components of the polymer overlay system and that the components are:
   1) In accordance with this Section.
   2) Fully compatible with one another.

d. The Installer's certification with the Provider's written concurrence that the polymer overlay system is fully compatible with all deck repair materials.

e. Certified Test Report from an independent nationally recognized laboratory stating that the polymer resins in the polymer overlay system components meet the requirements in this Section.
   1) Test results must be from within a three year period of the submittal.

f. Certified Test Report from an AASHTO accredited testing laboratory confirming the compliance of the aggregate material with the test requirements of this Section.
   1) Test results must be from within a one year period of the submittal.

C. Method for mixing of the polymer resins
   1. The Provider's written concurrence that the selected mixing method is acceptable and compatible with the polymer overlay system.
   2. Mixing ratio of the polymer resins.

D. A warranty letter to the Engineer and the Department Bridge Management Engineer stating that the Contractor guarantees the polymer overlay system against material and installation defects incurred under traffic for a period of 5 years.
   1. The guarantee period starts on the date of Physical Completion.
   2. Include in the letter:
      a. State Project Designation
      b. State Project Name
      c. State Structure Numbers
      d. Contractor, Provider, and Installer Name
   3. Defects (performance failures) include:
      a. Spalling: Broken or missing pieces of polymer overlay system.
      b. Scaling: Visible, exposed, rough surface texture resulting from a loss of aggregate or resin.
      c. Delamination: Visible or audible debonding of the polymer overlay system at the bond line (interface) with the existing bridge receiving surface.
      d. Cracking: Visible cracks not reflected from a crack in the existing deck.
      e. Loss of skid resistance: Skid resistance less than 40 as measured according to ASTM E 274.
   4. The guarantee covers 100 percent of the polymer overlay system materials and installation costs.
   5. Removal and replacement of the polymer overlay system for failed sections.
   6. The Department will notify the Contractor of defects to be repaired during the guarantee period.

a. Submit detailed plans and procedures of corrective work according to Provider's recommendations and obtain the Department's authorization before commencing work.
b. Perform corrective work within 60 days of notification.

1.6 QUALITY CONTROL

A. Technical Support Representative
1. Provide a Technical Support Representative from the Provider onsite during surface preparation and application of the polymer overlay system on the first day the polymer overlay system is installed on a structure.
a. The Technical Support Representative must have a minimum of 3 years of experience with the system and with guiding and assisting installers in the polymer overlay system installation.
b. The Technical Support Representative will instruct the workers in proper mixing, application technique, safety precautions, traffic opening time, and environmental requirements.
c. The Technical Support Representative must be available for consultation but not necessarily present at the job site for the remaining work.
2. The Department reserves the right to require the Technical Support Representative to be onsite if at any time the Engineer is concerned with the product installation quality.

B. Prior Performance
1. The selected polymer overlay system must have at least two years of satisfactory performance for non-interstate use and four years of satisfactory performance for interstate use in similar environmental conditions as the project in which it will be applied.
2. Products without the required years of prior satisfactory performance will only be considered for use with approval.
a. Do not use for bidding purposes.

PART 2 PRODUCTS

2.1 POLYMER OVERLAY SYSTEM

A. Use a thin bonded polymer overlay system that chemically cures to provide an impervious wearing surface consisting of the following:
1. Penetrating Crack Filler
2. Polymer Resin
3. Broadcast Aggregate

B. Penetrating Crack Filler
1. Provide a penetrating crack filler as required by the Provider.

C. Polymer Resin
1. Two-part Epoxy-Urethane Co-Polymer (Type 1) that meets the requirements of Table 1.
2. Free of fillers, volatile solvents, and external/conventional flexibilizers.

Table 1

PHYSICAL PROPERTIES OF THE CURED POLYMER RESIN		
Property	**Value**	**Method**
Compressive Strength, min. psi	5,000	ASTM C 579
Tensile Strength, min. psi	2,000	ASTM D 638
Tensile Elongation, min. percent	30-80	ASTM D 638
Water Absorption, max. percent by wt.	1.0	ASTM D 570
Shore D Hardness, min. 77°F	60-75	ASTM D 2240
Gel Time, minutes	15-45	ASTM C 881
Adhesion to Concrete	100% failure in concrete	ACI-503-R, Pull Out Test
Flexural Yield Strength, min. psi	3,000	ASTM D 790
Percent Solids	100	

D. Broadcast Aggregate

1. Thoroughly washed and kiln dried to maximum moisture content of 0.2 percent by weight according to ASTM C 566.
2. Use aggregate with the properties shown in Table 2 with aggregate gradation according to the requirements in Table 3, or use aggregate with the properties shown in Table 4 with aggregate gradation according to the requirements in Table 5.

Table 2

BASALT OR FLINT AGGREGATE PROPERTIES	
Soundness, ASTM C 88	3.0 max
LA Abrasion, Grade D, ASTM C 131	20.0% max.
Micro Deval Abrasion, ASTM D 6928	10.0% max.
Mohs Scale Hardness	7.0 min.

Table 3

BASALT OR FLINT AGGREGATE GRADATION	
Sieve Size	**Percent Passing**
0.187 inch; No.4	100
0.078 inch; No.10*	10 – 35
0.033 inch; No.20	0 – 10
* 100 percent of the aggregate has at least one mechanically fractured face for materials being retained on the #10 sieve according to ASTM D 5821.	

Table 4

CALCINED BAUXITE AGGREGATE PROPERTIES	
Soundness, ASTM C 88	3.0 max
LA Abrasion, Grade D, ASTM C 131	20.0% max.
Micro Deval Abrasion, ASTM D 6928	5.0% max.
Mohs Scale Hardness	8.0 min.
Aluminum Oxide, ASTM C 25	87.0% min.

Table 5

CALCINED BAUXITE AGGREGATE GRADATION	
Sieve Size	**Percent Passing**
0.187 inch; No.4	100
0.132 inch; No.6	95 - 100
0.046 inch; No.16*	0 - 5
* 100% of the aggregate has at least one mechanically fractured face for materials being retained on the #16 sieve according to ASTM D 5821.	

2.2 EQUIPMENT

A. Polymer Overlay Removal
1. Use a diamond tipped grinder or approved method to remove an existing polymer overlay system from the deck.

B. Metered Mixing
1. Use equipment capable of metering, mixing, and distributing the polymer resin.
   a. Use equipment that features positive displacement volumetric metering pumps controlled by a hydraulic power unit.
   b. Use motionless, in-line mixing.
2. Use equipment that is approved by the Provider.

C. Hand Mixing
1. Use equipment that is approved by the Provider.

D. Broadcasting Aggregate
1. Use mechanical equipment capable of dispensing the aggregate onto the deck in a uniform manner as required by the Provider.

PART 3 EXECUTION

3.1 STORAGE AND HANDLING

A. Polymer Resin
1. Identify the containers as Part A and Part B and plainly mark with:
   a. Manufacturer's name
   b. Manufacturer's address
   c. Name of the product
   d. Mixing proportions and instructions
   e. Lot and batch numbers
   f. Date of manufacture
   g. Quantity
2. Transport to and store on the job site in a dry, weather protected environment away from moisture, and within the maintained temperature range of 60 to 100 degrees F and according to Provider's recommended installation instructions.

B. Broadcast Aggregate
1. Store aggregate in a clean, dry location, protected from rain and other moisture sources.
2. Protect the aggregate from contaminants on the job site.

C. Handling Liquid Materials
1. Use protective gloves, clothing, boots, and goggles when directly exposed to the material.
2. Provide manufacturer's safety data sheets to workers and inspectors.

3.2 POLYMER OVERLAY REMOVAL

A. Remove the existing polymer overlay as shown or as required by the Engineer.
1. Do not damage concrete deck when removing polymer overlay.

3.3 SURFACE PREPARATION

A. Surface Defects
1. Repair deck surface defects before installing the polymer overlay system.
a. Use a concrete repair material that meets Provider's recommendations and is compatible with the polymer overlay system being used.
b. Use concrete repair materials free of magnesium phosphate.

B. Shot-Blasting
1. Clean the entire concrete deck surface with steel shot blast to remove oil, dirt, rubber, and other materials that may be detrimental to the polymer overlay bonding and curing according to the Provider's recommendations.
a. Use sandblasting equipment or mechanical grinders only in areas that cannot be reached with steel shot-blasting.
1) Sandblast or grind before shot-blasting. Refer to ASTM D 4285.
2. Produce a surface relief that meets the International Concrete Repair Institute (ICRI) Surface Preparation CSP 5-7.

C. Traffic
1. Do not allow traffic on the deck that has been shot-blasted.
2. Only allow the polymer overlay system equipment on cleaned surfaces.

3.4 APPLICATION

A. Concrete Surface
1. Complete deck repairs and surface preparation before applying the polymer overlay system.
2. Clean the concrete surface and apply a penetrating crack filler as required by the Provider.
3. Do not apply the polymer overlay system when it has rained within 24 hours or is expected to rain within 8 hours of application.
4. Verify the moisture content in the concrete substrate does not exceed 4.0 percent when measured by an electronic meter.

5. Apply the polymer overlay system only when the deck and ambient air temperature is a minimum 50 degrees F and rising.
6. Verify that treated surfaces are dry at the time of second application.

B. Mixing
1. Measure and mix the polymer resin components as recommended by the Provider.
   a. Maintain mix ratios according to the Provider's recommendations.
2. Mix polymer resin immediately before dispensing.
3. Verify the mix ratio by volumetric sampling at the beginning of the application, mid operation, and at the end of the application of each layer.
   a. Use containers with graduated markings with not less than 5 gallon capacity.
   b. Remove the static mixer and dispense each component into separate containers.
      1) Dispense at least five gallons of the primary component for ratio comparison.
      2) Uncontaminated samples may be returned to the reservoirs they were originally dispensed from.
   c. The Engineer or Technical Support Representative may request additional sampling.

C. First and Second Layers of Overlay
1. Evenly distribute the polymer resin on the clean, dry deck surface at the rate recommended by the Provider.
   a. Use new notched squeegees, $^{3}/_{16}$ inch minimum, on the first lift of every application to verify sufficient thickness of the overlay.

D. Overlay Thickness
1. Provide the number of layers and application rates of the liquid in each layer according to the Provider's recommendations.
2. Provide a total overlay thickness of at least 3/8 inch.

E. Time Limits for Broadcast Aggregate
1. Use the following maximum time allowed after application of liquid before broadcasting the aggregate in Table 6 unless directed otherwise by the Provider.

Table 6

Time Limits	
Temperature	**Maximum Time**
Above 90°F	10 minutes
80°F to 90°F	15 minutes
70°F to 80°F	20 minutes
60°F to 70°F	25 minutes
50°F to 60°F	35 minutes

F. Broadcasting Aggregate
1. Broadcast the aggregate before the polymer begins to gel.
   a. Cover the surface until no wet spots remain.

2. Drop the aggregate vertically so the level of the liquid is not disturbed.

G. Remove Excess Aggregate
1. Completely remove excess and loose aggregate after the overlay has hardened by vacuum or with compressed air before applying subsequent layers according to the Providers recommendations. Refer to ASTM D 4285.
2. Aggregate may be reused for subsequent lifts if it is removed directly into containers, screened to required gradation, and stored free of contaminants.

H. Longitudinal Joints in the Overlay
1. Stagger and overlap joints between successive layers 6 to 12 inches so that no ridges appear between two adjacent lanes.
2. Maintain straight construction joints between adjacent placements and lifts.

I. Traffic
1. Do not allow vehicles on the polymer overlay while it is curing.
2. Allow traffic on the final layer or in between layers after the resin has cured, as determined by the Provider, and after removal of excess and loose aggregate.
   a. Brush blast the surface with shot blast according to the Provider's recommendations before applying additional layers when traffic has been allowed on the cured surface between layers.

J. Work performed contrary to the Technical Support Representatives instructions will be deemed non-conforming.

3.5 LIMITATIONS

A. New Bridge Decks and Approach Slabs
1. Cure newly placed concrete for at least 28 calendar days before beginning installation of polymer overlay system.

B. Bridges constructed offline and moved into their final location by self- propelled modular transporters (SPMT)
1. Apply the polymer overlay system no sooner than 30 calendar days after setting the bridge in its final location.

C. Prevent material and debris from falling into streams, pedestrian areas, live traffic, or railroad tracks.

3.6 POLYMER OVERLAY REPAIR

A. Locate and mark visible polymer overlay repair areas as shown and in the presence of the Engineer.

1. Sound the polymer overlay around repair area for delamination of the polymer overlay to determine repair limits.
2. Square off the edges of polymer overlay system repair area six inches beyond the determined limits and parallel to the travel lane.
3. Sawcut the perimeter of polymer overlay system repair area with a 1/2" deep sawcut.

B. Remove existing polymer overlay within the repair area according to this Section, Article 3.2.
   1. Sound the concrete deck in the repair area for delamination of the concrete deck to determine the need for structural pothole patching. Refer to ASTM D 4580.

C. Prepare the deck surface within the repair area according to this Section, Article 3.3.
   1. Do not substitute sandblasting or mechanical grinding where shot blasting is required.

D. Apply the polymer overlay system within the repair area according to this Section.

END OF SECTION

October 19, 2016

SECTION 03374S

MOVE BRIDGE

Add Section 03374:

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Moving bridges that are constructed offline to their final locations by self propelled modular transporters (SPMT), lateral slide, longitudinal launch, or crane.

B. Preparing the bridge staging area and travel path for constructing and moving bridges.

C. Bridge temporary works for constructing new bridges at a temporary location.

D. Bridge monitoring.

E. Assessing and providing remediation before opening bridge to traffic.

1.2 RELATED SECTIONS

A. Section 02455: Driven Piles

B. Section 03055: Portland Cement Concrete

C. Section 03211: Reinforcing Steel and Welded Wire

D. Section 03310: Structural Concrete

E. Section 03390: Concrete Curing

F. Section 03392: Penetrating Concrete Sealer

G. Section 03412: Prestressed Concrete

H. Section 03924: Structural Concrete Repair and Sealing

I. Section 05120: Structural Steel

J. Section 06055: Timber and Timber Treatment

K. Section 09981: Concrete Coating

1.3 REFERENCES

A. AASHTO LRFD Bridge Construction Specifications

B. AASHTO LRFD Bridge Design Specifications

C. UDOT Bridge Management Manual

D. UDOT Structures Design and Detailing Manual (SDDM)

E. UDOT Structures Quality Control/Quality Assurance (QC/QA) Procedures

1.4 DEFINITIONS

A. Deflection Change – Elevation change of the ends of a span relative to its mid-span.

B. Embedded Items - Scuppers, manholes, anchor bolts or fixtures for bearings, barriers, light-poles, signs, utilities, similar appurtenances, and post-tensioning components - whether permanent or temporary.

C. Twist – Measurement of the upward or downward deflection of one bridge corner relative to the plane defined concurrently by the elevations of the other three bridge corners.

D. Working Drawings: Drawings produced by the Contractor that supplement the contract drawings to provide information not included in the contract documents, but that is required to fabricate, erect, transport or temporarily support the structure or structural elements in the completion of the work.
1. Working drawings do not supersede the contract drawings.

E. Approval of Working Drawings: Acceptance by the Department for use on the project. The Department will review working drawings for general conformance with the design concept and compliance with the contract documents. Review and approval do not relieve the Contractor from responsibility for errors, correctness of details, conformance to the contract, and the successful completion of the work.

F. Temporary Works: Facilities that are generally designed by the Contractor and employed by the Contractor in the execution of the work, and whose failure to perform properly could adversely affect the character of the contract work or endanger the safety of adjacent facilities, property, workers, or the public. Such facilities include but are not limited to falsework, forms and form travelers, cofferdams, shoring, water control systems, and temporary bridges.

1.5 SUBMITTALS

A. Working Drawings for Bridge Temporary Works for approval.
   1. Design according to the AASHTO LRFD Bridge Construction Specifications Section 3 (Temporary Works).
   2. Design according to the AASHTO LRFD Bridge Design Specifications and the SDDM when the bridge temporary works and permanent bridge will be used as a public route.
   3. Provide drawings defining the geometry, materials, and member sizes of the bridge temporary works.
      a. Include foundations and details of temporary bents or abutment seats to support the span under construction, including piling, spread footings, or other foundations.
   4. Provide calculations indicating the bridge temporary works are adequate for the proposed loads and that settlement or elastic deflections of the bridge temporary works will not adversely affect the bridge moved.
   5. Prepare drawings according to the following:
      a. Submit drawings electronically in PDF format. Use 11 x 17 inch sheets with a 1½ inch blank margin on the left edge. Place the following information in the title block in the lower right corner of each sheet:
         1) State Project Designation
         2) State Project Name
         3) State Structure Number
         4) Contractor, Fabricator, or Erector Name
         5) Contractor, Fabricator, or Erector Drawing Number
         6) Contractor, Fabricator, or Erector Sheet Number
      b. Revise and resubmit drawings when directed by the Department.
      c. Provide the seal of a Professional Engineer (PE) or Professional Structural Engineer (SE) licensed in the State of Utah. Place the seal in the lower right corner of each sheet when required.
   6. Prepare engineering calculations according to the following:
      a. Submit calculations electronically in PDF format. Use 8½ x 11 inch sheets with a 1-inch blank margin on the left edge or 11 x 17 inch sheets with a 1½ inch blank margin on the left edge. Title block location is at the top of 8½ x 11 inch sheets or the lower right corner of 11 x 17 inch sheets. Place the following information in the title block:
         1) State Project Designation
         2) State Project Name
         3) State Structure Number
         4) Contractor, Fabricator, or Erector Name
         5) Contractor, Fabricator, or Erector Drawing Number
         6) Contractor, Fabricator, or Erector Sheet Number
      b. Provide the seal of a PE or SE licensed in the State of Utah on engineering calculations. Place the seal on the calculation cover sheet.
      c. Certify that engineering calculations have been checked according to the UDOT Structures Quality Control/Quality Assurance (QC/QA) Procedures.

B. Lifting, Transporting, and Setting Plan for approval.
   1. Bridge move using SPMT or similar system

a. Provide details of the bridge staging area and travel path including at least the following:
1) Location
2) General layout
3) Surface grading
4) Surfacing material
5) Drainage
6) Environmental protection
7) Material storage areas
8) Access
9) Fences
10) Gates
11) Barriers

b. Provide a plan view of the travel path identifying all obstacles requiring removal and replacement, all structures crossed, and all utilities crossed, over and under.

c. Provide documentation of utility coordination.
1) Signed confirmations of coordination from the utility owner are required when crossing high pressure gas lines and main water lines.

d. Provide details of travel path and planned movements. Include at least the following:
1) Plan view of axle lines.
2) Average effective ground pressure under SPMT or similar units.
3) Maximum single wheel load and anticipated wheel contact patch size.

e. Provide a geotechnical evaluation of the bridge staging area and travel path.
1) Identify areas requiring ground improvement.
2) Provide details of required improvements.

f. Identify and detail plating or bridging required at utilities.

g. Identify bridges crossed.
1) List the structure number.
2) Provide a load rating and evaluation of the structure crossed.

h. Identify all pipes, culverts, and walls, for example, within the load influence.
1) List their structure number if available.
2) Provide a load rating/evaluation for the load influencing them.

i. Define and detail any temporary shoring of structures crossed.
1) Temporary shoring is required if the operating load rating factor is less than 1.

j. Identify items requiring temporary removal and replacement.
1) Coordinate with the owner of the item to determine plan requirements and limitations.

k. Include the minimum horizontal clearance to the critical obstacle along the path.

l. Include the minimum vertical clearance to the critical obstacle along the path.

m. Include means to adjust final alignment, elevation, and location to correct for or accommodate deviations from the required setting tolerances if tolerances are not met.

2. Bridge move using lateral slide or longitudinal launch.
   a. Provide details of the bridge staging area and travel path including at least the following:
      1) Location
      2) General layout
      3) Surface grading
      4) Surfacing material
      5) Drainage
      6) Environmental protection
      7) Material storage areas
      8) Access
      9) Fences
      10) Gates
      11) Barriers
   b. Provide a plan view of the travel path identifying all obstacles requiring removal and replacement, all structures crossed, and all utilities crossed, over and under.
   c. Provide documentation of utility coordination.
      1) Signed confirmations of coordination from the utility owner are required when crossing high pressure gas lines and main water lines.
   d. Provide details of travel path and planned movements. Include at least the following:
      1) Maximum permissible deviation from the exact slide plane to the constructed slide plane.
      2) Maximum possible load on a single slide bearing.
      3) Minimum possible load on a single slide bearing.
      4) Clearances to fixed obstacles.
      5) Plan for controlling and directing the location of the bridge during the slide.
      6) Maximum deflections along the slide path on the temporary support and permanent structure during the move.
   e. Provide a geotechnical evaluation of the bridge staging area and travel path.
      1) Identify areas requiring ground improvement.
      2) Provide details of required improvements.
   f. Identify and detail plating or bridging required at utilities.
   g. Include means to adjust final alignment, elevation, and location to correct for or accommodate deviations from the required setting tolerances if tolerances are not met.

3. Bridge move using cranes.
   a. Meet the erection plan requirements in Section 05120 for bridges using steel girders.
   b. Meet the erection plan requirements in Section 03412 for bridges using concrete girders.
   c. Include means to adjust final alignment, elevation, and location to correct for or accommodate deviations from the required setting tolerances if tolerances are not met.

C. Move System for approval.
1. Bridge move using SPMT or similar system.
a. Provide details of the move system.
1) Move equipment includes the heavy lift system such as SPMTs, jacks, or cranes used to raise or lower the structure, and transport systems such as SPMTs or similar systems used to laterally transport the structure.
b. Provide at least the following information:
1) Show the center of gravity (CG) of the bridge being moved and the weight being moved.
a) Base the CG and weight on actual, known component dimensions and known material densities.
2) Support locations between the move equipment and the bridge being moved.
3) Maximum vertical load demands and capacities.
a) On the controlling axle line.
b) On the controlling vertical jack.
4) Maximum vertical load demands and capacity of the weakest component in the vertical load path.
5) Show the number of wheels or axles in each hydraulic group and the geometry of the wheels or axle lines in each hydraulic group.
a) Use of at least 3 hydraulic groups is required.
6) Anticipated maximum stroke requirements.
7) Stability limits including, but not limited to, the maximum longitudinal and transverse grades along the path and the maximum permitted longitudinal and transverse grades based on system properties.
8) Maximum permitted deviation of support columns from vertical and maximum anticipated deviation of support columns from vertical.
9) Step by step move procedures.
a) Include operational details for the control of the lifting, transporting, and setting.
b) Include quality control steps. Quality control steps in this context are the steps operators take to assure the system is properly set up, and that the set up matches the submitted drawings.
c) Include steps to assure safety during the move.
10) An hour by hour schedule of the move.
2. Bridge move using lateral slide or longitudinal launch.
a. Provide details of the move equipment.
1) Move equipment includes the heavy lift system (for example, jacks or cranes used to raise or lower the structure), and transport systems (jacks, slide pads, rollers or other systems used to laterally move the structure).
b. Include at least the following information:
1) Weight of the system being moved.
2) Minimum and maximum anticipated friction coefficients.

3) Minimum and maximum anticipated slide force.
4) Jack capacity.
5) Maximum capacity over demand ratio of the weakest component along the lateral force system.
6) Stroke length and rate.
7) Method to reverse movement along the travel path.
8) Equipment used to control and direct the location of the bridge during the slide.
9) Step by step move procedures.
a) Include operational details for the control of the lifting, transporting, and setting.
b) Include quality control steps.
c) Quality control steps in this context are the steps operators take to verify the system is properly set up, and that the set up matches the submitted drawings.
d) Include steps to provide safety during the move.
10) An hour by hour schedule of the move.

3. Bridge move using cranes.
a. Included in Lifting, Transporting, and Setting Plan for bridge moves using cranes. Refer to this Section, Article 1.5, paragraph B.

E. Contingency Plan for approval.
1. Identify potentially disruptive events and provide a contingency plan for each.
2. Address equipment breakdown, delays during the move, and any other risks.
3. Define key personnel, their responsibilities, and their required actions if any part of the contingency plan must be implemented.
4. List backup equipment on site and local contacts for replacement parts or service.
5. Provide detour plan in case road will not reopen as scheduled.

F. Safety and Communication Plans for approval. Include at least the following:
1. Safety Plan
a. Schedule of operations
b. Organization of machinery
c. Safety gear requirements
d. Operational perimeters
2. Communication Plan
a. Public impacts, methods of communication during bridge move, and lead communicator.
b. Contact information for:
1) Bridge move supervisor (primary point of contact for the move)
2) Move system supervisor
3) Contractor supervisor
4) Safety supervisor
5) Engineer of record
6) Contractor's engineer

7) Heavy lift engineer
8) Structures Division representative
9) Resident engineer
10) Public involvement liaison.

G. Monitoring Plan for approval.
1. Submit as working drawings or as a manual.
2. Include at least the following:
a. Description and details of the move monitoring system.
1) Refer to this Section, Article 3.4, paragraph C for minimum requirements.
b. Measuring equipment, procedures, required measurements, and locations of geometry control reference points on the bridge and in the bridge staging area.
1) Measurements may be elevations, dimensions, or other readings.
c. Pre-move and move monitoring.
d. Warning levels and absolute limit levels
1) Define allowable tolerances and warning levels.
a) Set displacement limits to avoid damage to the bridge during the move.
b) Set displacement limits that are less than or equal to the limits defined in the contract plans
e. Minimum detectable movements and system accuracy.
f. Potential remedial actions that must be implemented when measurements exceed the warning levels.
g. Required measurements and when they are taken and recorded.
1) Refer to this Section, Article 3.4, paragraph C for minimum requirements.

H. Post move and pre-opening work for approval.
1. List activities and anticipated time frames for work requiring completion before opening the bridge to traffic.

I. General Requirements
1. Allow the Engineer 14 calendar days to review and approve submittals.
a. The Engineer may grant an increase in the number of working days for the project when that time is exceeded.
b. This review period applies each time the drawings and calculations are submitted.
2. Do not begin work until receiving submittal approval.
3. Do not deviate from the approved submittal unless authorized in writing by the Engineer. Assume the responsibility for costs incurred due to faulty detailing or fabrication.

PART 2 PRODUCTS

2.1 MATERIALS

A. Concrete

1. Refer to Section 03055.

B. Reinforcing Steel
1. Refer to Section 03211.

C. Penetrating Concrete Sealer
1. Refer to Section 03392.

D. Driven Piles
1. Refer to Section 02455.

E. Structural Steel
1. Refer to Section 05120.

F. Timber
1. Refer to Section 06055.

G. Concrete Coating
1. Refer to Section 09981.

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. Move the bridge to its final location without damage and loss of strength.

B. Use methods and procedures that provide adequate safety to the general public during:
1. Construction activities
2. Structure move
3. Erection

C. Use heavy lift equipment and falsework placed over or adjacent to traveled roadways, navigational or recreational waterways, pedestrian facilities, and any existing commercial, industrial, or other facilities.

3.2 BRIDGE TEMPORARY WORKS

A. Construct bridge temporary works according to the authorized working drawings.

B. Verify the following before constructing the new bridge.
1. The temporary support structures are constructed according to authorized working drawings.

2. The support surfaces are constructed to the required elevations and tolerances with sufficient clearances to accommodate the heavy lift system.

C. Embedded Items
1. Verify that all Embedded Items are in their correct locations and elevations according to the authorized working drawings and before casting concrete in the permanent bridge.

D. Concrete Casting and Curing
1. Concrete Placement
a. Refer to Section 03310.
2. Concrete Curing
a. Refer to Section 03390.

3.3 PREPARATION FOR BRIDGE MOVE

A. Safety and Communication
1. Review the authorized Safety and Communication Plans with all personnel involved with the bridge move.
a. Include at least the engineer of record, safety supervisor, heavy lift engineer, contractor's engineer, resident engineer, and Structures Division representative.
2. Conduct a safety meeting immediately before the bridge move to address unforeseen, variable factors with all personnel involved.

B. Heavy Lift System such as jacking, cribbing, raising, and lowering
1. Follow the authorized Lifting, Transporting, and Setting Plan for jacking, cribbing, raising, and lowering the bridge.
a. Adhere to the limitations for jacking with regard to corresponding stability conditions for the heavy lift system and falsework.
2. Implement Contingency Plan in the event of a major breakdown or equipment malfunction.

3.4 BRIDGE LIFTING, TRANSPORTING, AND SETTING

A. Follow the authorized Lifting, Transporting, and Setting Plan.

B. Do not lift or attempt to move the bridge until it has attained a minimum age of 21 days since the last casting operation and has attained the specified 28 day minimum compressive strength, unless otherwise authorized.

C. Monitor the bridge during lifting, transporting, and setting according to the authorized Monitoring Plan.
1. Provide a monitoring system capable of the following:
a. Measuring the change in bridge camber at initial lift.

b. Measuring the relative twist between adjacent lines of supports at initial lift and during the move.
c. Measuring the relative change in elevation between adjacent lines of support at initial lift and during the bridge move.
1) This measurement is not required for bridges moved with two lines of supports.
d. Indicating when bridge measurements exceed warning levels and absolute limit levels.
2. Take and record measurements at least as follows:
a. Before beginning the move
1) Set the move monitoring system.
2) Monitor the bridge through a typical daily temperature cycle using the monitoring system used during the move.
a) Record measurements just before dawn of each day and when the bridge reaches the approximate maximum temperature.
b. Immediately before the initial lift.
1) Record the initial measurements.
a) Initial measurements establish the baseline condition of the bridge.
c. Immediately after the initial lift.
1) Record measurements and compare the bridge to the baseline condition.
2) Calculate the deflection change as the difference between the condition just before to just after the initial lifting of the bridge.
3) Verify that measurements are within tolerance limits.
d. During the bridge move
1) Continuously monitor the bridge.
e. When the bridge is aligned and ready for setting, but is not in contact with the final supports.
f. After setting the bridge in its permanent location.
1) Record a final set of monitoring system measurements.
2) Verify that measurements are within anticipated and allowable tolerance limits specified for permanent elevations.

D. Limit deflection change, twist, and other measurements to the limits defined in the authorized Monitoring Plan.

3.5 SETTING TOLERANCES

A. Bridge Alignment: Location and Clearances
1. Comply with the following for the final condition of the span after move:
a. Do not exceed 1 inch maximum deviation at each end of span from overall longitudinal alignment of an individual span after setting.
b. Do not exceed 1 inch maximum deviation from overall transverse location for example for longitudinal position at each line of bearings.

c. Limit the maximum alignment deviation in both primary plan directions at each end of the span or spans being set to not more than 1 inch or to that required for the accommodation of manufactured expansion joint components and bearings, whichever is less.

d. Keep individual elements or surfaces within 1 inch of location with respect to similar matching surfaces at expansion joints such as plane of web or parapet) of adjacent spans, bent, or abutment features in the absence of other constraints.

B. Bridge Bearings: Elevation and Location

1. Keep the elevations of the bridge bearings for the prefabricated bridge within + or - 1/8 inch of required elevations, unless tighter tolerances are required in the plans and the authorized shop drawings.
2. Keep the plan location of bridge bearings with respect to the girders within the limits shown and the authorized bearing shop drawings.
3. Address elevation and plan location deviations that do not meet the tolerances according to the authorized Lifting, Transporting, and Setting Plan.

C. Expansion Joints

1. Keep the elevations and alignments of surfaces of adjacent spans to accommodate expansion joint devices within + or - $^1/_8$ inch of dimensioned locations, unless tighter tolerances are required according to the expansion joint manufacturer or as shown and in authorized expansion joint shop drawings.
2. Address deviations that do not meet the tolerances according to the authorized Lifting, Transporting, and Setting Plan.

3.6 BRIDGE ASSESSMENT AND REMEDIATION

A. Visually inspect the bridge and substructure in the presence of the Engineer post move and before opening bridge to traffic.

1. Identify spalling and cracking that requires repair.
   a. Indicate whether the repair must be completed before opening to traffic or if the repair can be completed at a later date.

B. Repair spalling. Refer to Section 03924.

C. Repair cracks

1. Refer to Table 1 for classification of crack treatments.

Table 1

Crack Treatments			
Crack Width	**Location**	**Treatment**	**Related Section(s)**
Less than or equal to 0.016 inches	Substructure and superstructure	Penetrating concrete sealer or concrete coating per project requirements	Refer to 03392
Greater than 0.016 inches and up to and including 0.25 inches	Substructure and superstructure	Epoxy injection	Refer to 03924
Greater than 0.25 inches	Substructure and superstructure	Delamination repair and penetrating concrete sealer or concrete coating per project requirements	Refer to 03392 and 03924

3.7 RESTORATION OF ORIGINAL CONDITIONS

A. Restore conditions of the bridge staging area, travel path, and demolition site according to the agreements with each property owner and to the satisfaction of the Engineer.

END OF SECTION

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS

PART 6:
THIRD-PARTY AGREEMENTS

Addendum ~~2~~ 6 - ~~October 6~~November 3, 2016

TABLE OF CONTENTS

A. GENERAL

The Design-Builder shall perform all of the Department's obligations in each Third-Party Agreement, except for payment to Third Parties for Third-Party-performed work. The Department retains its rights and responsibilities pertaining to cost share reimbursement, audit, oversight, and any other elements of the Third-Party Agreements at the Department's sole discretion.

KEARNS IMPROVEMENT DISTRICT
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT"), **and Kearns Improvement District**, a Local Improvement District of the State of Utah, ("District") each as **("Party")** and jointly as ("Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, the design-build contractor will complete the design and administer construction of the Project ("Design-Builder"); and

WHEREAS, UDOT has identified District facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the District desires for the Design-Builder to design and perform the Utility Work on the District's facilities necessitated by the Project; and

WHEREAS, the District will perform the necessary design review and inspection to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement, the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering the Utility Work to be accomplished by UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. PROJECT RESPONSIBLE FOR COST

In accordance with Utah Code § 72-6-116(3)(a)(ii), UDOT is responsible for 100% of the cost of the Utility Work of the District's facilities for those costs that comply with Utah Administrative Code R930-8.

2. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

The District's contact person is Greg Anderson, telephone number (801) 912-0282, and e-mail ganderson@kearnsid.org.

After awarding the Project, UDOT will provide the District with the Design Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

3. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the District's facilities and requirements for inclusion in this Agreement and the Request for Proposals, UDOT gave the District authorization for preliminary design engineering on April 26, 2016.

4. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the District.

5. PROJECT COORDINATION

The District requested that UDOT include items of Utility Work for relocating and adjusting the District's facilities in the Project.

During the development of the Project design, the District and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the District's facilities can be avoided. If Utility Work for the District's facilities is required by the Project, UDOT will be responsible to identify the conflicts and to design and construct the Utility Work of the District's facilities. The District will perform the necessary design reviews prior to the start of Utility Work. UDOT's Project Representative will be responsible for coordinating with other utility companies as it relates to the District's facilities.

6. DISTRICT REQUIREMENTS

UDOT will comply with the following the District Utility Work requirements:

a. Size and depth of the District Utility crossings must be determined and recorded prior to any Project directional boring or excavation activities near the District's facilities.
b. A District representative must be present during potholing, crossing, or relocation activities of the District facilities.
c. The District requires review of material and product specification submittals for District approval prior to installation.
d. All District water service interruptions require following activities:
    i. Coordinate with the District for notification procedures to its serviced customer(s) and for processes to minimize service interruptions.
    ii. The District must approve the extent of service interruptions before Utility Work may begin.
e. Notification must be given to the District prior to performing any potholing, crossing, or Utility Work on the District facilities. Utility Work installed without notification to the District will require remedial efforts for the District acceptance. See section 11 below.
f. UDOT will supply as-constructed plans, in AutoCadd format, upon completion of any required Utility Work including betterment work.
g. UDOT will warrant the Utility Work completed on the District's facilities for two years after the date of acceptance. UDOT will remove, replace, or correct the Utility Work at no cost to the District when an element of Utility Work does not meet Agreement requirements.

7. UDOT TO DESIGN AND CONSTRUCT DISTRICT'S UTILITY WORK

UDOT will schedule and meet with the District to review the design and scheduling of the Utility Work for the District's facilities at specific locations on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

UDOT will design the Utility Work in accordance with the District's standards regularly followed by the District in its own work and not considered a betterment. In the event of a conflict between UDOT and the District standards, the higher standard will be applied.

b. The District's current standards and specifications, dated September 2016, can be found at the District web site http://kearnsid.org/engspecs.PDF that are incorporated into this Agreement by reference.

c. UDOT will secure permits required for Utility Work of the District's facilities.

8. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of the District's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8.

9. BETTERMENT WORK

If the District desires to include betterment work in the Project at any specific location UDOT may agree to the betterment providing the difference in costs between the functionally equivalent required Utility Work and the District's desired betterment work that is not required by the Project shall be at the sole cost of the District and the betterment work can be accommodated without delaying UDOT's Project. The betterment work will be addressed by separate supplemental agreement between UDOT and the District.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

10. SUPPLEMENTAL AGREEMENTS

UDOT and the District shall enter into supplemental agreements to cover Utility Work at specific Project locations. As part of the supplemental agreement, UDOT will provide design plans and Utility Work schedules for review and approval by the District prior to start of the Utility Work. A copy of the format of the proposed supplemental agreement is marked Exhibit "A" and is incorporated into this Agreement by reference.

The District will require a 2 week review and approval period for any final supplemental agreement submitted to the District by UDOT.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

11. UDOT TO NOTIFY THE DISTRICT BEFORE BEGINNING UTILITY WORK

UDOT will notify the District at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto, to allow the District time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis.

12. DISTRICT TO NOTIFY UDOT

The District's personnel shall notify UDOT's Field Representative upon arriving and leaving the Project site for verification of inspecting Utility Work. The District's personnel will comply with all applicable OSHA and Project safety requirements while within the Project limits.

13. INSPECTION

The District shall provide on-call engineering support by the District's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during Utility Work, and to perform the necessary inspection on the District's facilities installed by UDOT.

a. The District's engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on the District's facilities in accordance with the plans and specifications provided and/or approved by the District, including changes or additions to the plans and specifications, which are approved by the Parties hereto.

b. The District shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the District's facilities. The District shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.

c. UDOT will respond to the District's concerns within 24-hours of written notification.

d. The District, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the District may have with acceptance of the facilities upon completion of the Utility Work.

e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Utility Work does not relieve the District of its duties under a. through d. immediately above to ensure compliance with acceptable standards.

14. DAILY RECORDKEEPING

UDOT's Field Representative will keep daily records of the inspection performed by the District. Daily inspection records will be in duplicate on a form to be prepared by the District or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance and Certification Manager. The inspection records shall be signed by UDOT's Field Representative, and the District or its authorized representatives. Copies of the inspection records shall be retained by the parties to this Agreement.

15. REIMBURSEMENT

UDOT will not reimburse the District for costs incurred by the District personnel for design review, observation, inspection, and operation of valves performed as part of their regularly assigned duties. Should it become necessary for the District to procure outside services to perform design review, observation, or inspection to accommodate UDOT's Utility Work and Project schedule, the

District shall notify UDOT. Upon concurrence by UDOT, a supplemental agreement for the cost of the services will be executed at which time the District may procure outside services through appropriate solicitation.

16. SUBMITTAL OF ITEMIZED BILLS

The District shall submit itemized bills covering the actual costs incurred for outside services to perform design review, oversight, and inspection work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist
Utah Department of Transportation
PO Box 141510
SLC, UT 84114-1510

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement and be submitted to UDOT within 60 days following completion of outside services by the District on the Project. Otherwise, previous payments to the District may be considered final, except as agreed to between the Parties in advance.

UDOT will reimburse the District within 60 days after receipt of the billings, but only for items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the District to submit final billings within 6 months of the completion of outside services will result in UDOT's disallowance of that portion of outside services performed by the District.

17. SALVAGED MATERIALS

All materials from the District's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

18. RIGHT TO AUDIT

UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of the District pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. § 645, subpart A. Should this audit disclose that the District has been underpaid, the District will be reimbursed by UDOT within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the District has been overpaid, the District will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For purpose of audit the District is required to keep and maintain its records of outside services covered herein for a minimum of 3 years after final payment is received by the District from UDOT.

19. ACCEPTANCE AND MAINTENANCE

Upon completion of the Utility Work of the District facilities by UDOT, the District will accept, own, and maintain its own facilities. The District shall be the sole owner of the facilities upon

completion of the Project unless otherwise agreed to by the Parties. To the extent it may lawfully do so, the District further agrees to relieve UDOT from any responsibility or liability that may result from its new facilities or the operation thereof.

20. ACCESS

It is understood that access for maintenance and servicing of the District's facilities located on the right-of-way of the Project will be allowed only by permit issued by UDOT to the District, and that the District will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

21. INDEMNIFICATION

UDOT and the District are both governmental entities subject to the Governmental Immunity Act. Each Party agrees to indemnify, defend, and save harmless the other from and against all claims, suits and costs, including attorneys' fees for injury or damage of any kind, arising out of its negligent acts, errors or omissions of its officers, agents, contractors or employees in the performance of this Agreement, and from and against all claims, suits, and costs, including attorneys' fees for injury or damage of any kind. Nothing in this paragraph is intended to create additional rights to third parties or to waive any of the provisions of the Governmental Immunity Act. The obligation to indemnify is limited to the dollar amounts set forth in the Governmental Immunity Act, provided the Act applies to the action or omission giving rise to the protections in this paragraph. The indemnification in this paragraph shall survive the expiration or termination of this Agreement.

22. MISCELLANEOUS

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.

b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and the District.

c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

****

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

ATTEST:

Kearns Improvement District

Title: Finance Director

Title: General Manager

Date: 10/25/16

Date: 10-25-16

(Impress Seal)

RECOMMENDED FOR APPROVAL:

UTAH DEPARTMENT OF TRANSPORTATION

Title: Utility and Railroad Leader

Title: Project Director

Date:

Date:

UDOT Comptroller Office
Contract Administrator

KEARNS IMPROVEMENT DISTRICT SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and **Kearns Improvement District**, a Local Improvement District of the State of Utah, ("District") each as ("Party") and jointly as ("Parties").

The parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the Master Utility Agreement remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)
   b. The District requirements as shown in the MUA – the District Requirements, are modified as follows:
      i.
   c. Anticipated duration of Utility Work:
   d. Total estimated cost of the District's (100% reimbursable) outside services: (Detailed Estimate Attached)

2. UDOT will notify the District's Project Representative, Greg Anderson, telephone number (801) 912-0282, and e-mail ganderson@kearnsid.org at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

ATTEST:

Kearns Improvement District

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(Impress Seal)

. . . . . .

RECOMMENDED FOR APPROVAL:

UTAH DEPARTMENT OF TRANSPORTATION

_____ _____

Title: Utility and Railroad Leader

Title: Project Director

Date: _____ **Date:** _____

_____

UDOT Comptroller Office
Contract Administrator

. . . . . .

SOUTH JORDAN CITY
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT"), and the **City of South Jordan**, a Municipal Corporation of the State of Utah, ("City") each as ("Party") and jointly as ("Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, the design-build contractor will complete the design and administer construction of the Project ("Design-Builder"); and

WHEREAS, UDOT has identified City facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, City desires for the Design-Builder to design and perform the Utility Work on the City's facilities necessitated by the Project; and

WHEREAS, City will perform the necessary design review and inspection to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement, the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering the Utility Work to be accomplished by UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. PROJECT RESPONSIBLE FOR COST

In accordance with Utah Code § 72-6-116(3)(a)(ii), UDOT is responsible for 100% of the cost of the Utility Work of City's facilities for those costs that comply with Utah Administrative Code R930-8.

2. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or his designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or his designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

City's contact person is Brad Klavano, City Engineer, telephone number (801) 254-3742, and e-mail bklavano@sjc.utah.gov, or his designated representative, as assigned.

After awarding the Project, UDOT will provide the City with the Design Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

3. AUTHORIZATION FOR DESIGN WORK

To facilitate coordination and obtain technical information about City's facilities and requirements for inclusion in this Agreement and the Request for Proposals, UDOT gave City authorization for preliminary design engineering on April 26, 2016.

4. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. UDOT shall review with City additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project.

5. PROJECT COORDINATION

City requested that UDOT include items of Utility Work for relocating and adjusting City's facilities in the Project.

During the development of the Project design, City and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with City's facilities can be avoided. If Utility Work for City's facilities is required by the Project, UDOT shall be responsible to identify the conflicts and to design and construct the Utility Work of City's facilities. City shall perform the necessary design reviews prior to the start of Utility Work. UDOT's Project Representative shall be responsible for coordinating with other utility companies as it relates to City's facilities.

6. CITY REQUIREMENTS

UDOT will comply with the following City Utility Work requirements:

a. UDOT shall supply as-constructed plans, in PDF format, upon completion of any required Utility Work.

7. UDOT TO DESIGN AND CONSTRUCT CITY'S UTILITY WORK

UDOT shall schedule and meet with City to review the design and scheduling of the Utility Work for City's facilities at specific locations on the Project to ensure maximum lead time for advance order of materials and work force scheduling.

a. UDOT shall design the Utility Work in accordance with City's standards regularly followed by City in its own work and not considered a betterment. If there is a conflict between UDOT and City standards, then the higher standard will be applied. A copy of City's standards can be found at http://www.southjordancity.org/engineering-CSS.asp that is incorporated by reference.
b. UDOT will secure permits required for Utility Work of City's facilities.

8. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of City's facilities shall be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8.

9. BETTERMENT WORK

City Aesthetics and Landscaping Betterment Work ("Betterment Work") is described in attached Exhibit "A" that is incorporated by reference.

If City desires to include additional betterment work in the Project at any specific location UDOT may agree to the betterment provided the difference in costs between the functionally equivalent required Utility Work and City's desired betterment work that is not required by the Project shall be at the sole cost of City and the betterment work can be accommodated without delaying

UDOT's Project. The additional betterment work shall be addressed by separate supplemental agreement between the Parties.

Once a Design-Builder has been selected by UDOT, any additional betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the additional betterment work.

10. SUPPLEMENTAL AGREEMENTS

UDOT and City shall enter into supplemental agreements to cover Utility Work at specific Project locations. As part of each supplemental agreement, UDOT shall provide design plans and Utility Work schedules for review and approval by City prior to starting the Utility Work. A copy of the format of the proposed supplemental agreement is marked Exhibit "B" that is incorporated by reference.

UDOT shall provide City a two-week review and approval period for any final supplemental agreement submitted to City by UDOT.

If there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, then the Parties must first agree in writing to a modification to the supplemental agreement before the Utility Work on the changes or additions begins.

11. UDOT TO NOTIFY CITY BEFORE BEGINNING UTILITY WORK

UDOT shall notify City at least two business days before beginning any Utility Work covered by any supplemental agreements hereto, to allow City time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis.

12. CITY TO NOTIFY UDOT

City's personnel shall notify UDOT's Resident Engineer upon arriving and leaving the Project site for verification of inspecting Utility Work. City's personnel will comply with all applicable OSHA and Project safety requirements while within the Project limits.

13. INSPECTION

City shall provide on-call engineering support by the City Engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during Utility Work, and to perform the necessary inspection on City's facilities installed by UDOT.

a. The City Engineer and/or City's inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on City's facilities in accordance with the plans and specifications provided and/or

approved by City, including changes or additions to the plans and specifications, which are approved by the Parties.

b. City shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on City's facilities. City shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.

c. UDOT shall respond to City's concerns within 24-hours of written notification.

d. City, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns City may have with acceptance of the facilities upon completion of the Utility Work.

e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Utility Work does not relieve the City of its duty to review and inspect the Utility Work or to ensure compliance with acceptable standards.

14. DAILY RECORDKEEPING

UDOT's Resident Engineer will keep daily records of the inspection performed by City. Daily inspection records shall be in duplicate on a form to be prepared by City or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance and Certification Manager. The Parties shall sign the inspection records and retain copies of the inspection records.

15. REIMBURSEMENT

UDOT will not reimburse City for costs incurred by City personnel for design review, observation, inspection, and operation of valves performed as part of their regularly assigned duties. Should it become necessary for City to procure outside services to perform design review, observation, or inspection to accommodate UDOT's Utility Work and Project schedule, City shall notify UDOT. Upon concurrence by UDOT, a supplemental agreement for the cost of the services shall be executed at which time City may procure outside services through appropriate solicitation.

16. SUBMITTAL OF ITEMIZED BILLS

City shall submit itemized bills covering the actual costs incurred for outside services to perform design review, oversight, and inspection work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist
Utah Department of Transportation
PO Box 141510
SLC UT 84114-1510

Itemized bills shall include the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement, and be submitted to UDOT within 60

days following completion of outside services by City on the Project. Otherwise, previous payments to City may be considered final, except as agreed to between the Parties in advance.

UDOT will reimburse City within 60 days after receipt of the billings, but only for items complying fully with the provisions of Utah Administrative Code R930-8. Unless the parties otherwise agree in writing that more time is needed to submit a final billing, failure on the part of City to submit final billings within six months of the completion of outside services will result in UDOT's disallowance of that portion of outside services performed by City.

17. SALVAGED MATERIALS

Materials from City's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on the Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties.

18. RIGHT TO AUDIT

UDOT and the Federal Highway Administration shall have the right to audit all City cost records and accounts pertaining to the Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. § 645, subpart A. Should an audit disclose that City has been underpaid, UDOT shall reimburse City within 60 days of notification of audit finding in the amount of underpayment. Should an audit disclose that City has been overpaid, City shall reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For purpose of audit City is required to keep and maintain its records of outside services covered herein for a minimum of three years after City receives final payment from UDOT.

19. ACCEPTANCE AND MAINTENANCE

Upon UDOT's completion of the Utility Work of City facilities, and City's acceptance of the Utility Work, City shall own and maintain its facilities. City shall be the sole owner of the facilities upon completion of the Project unless otherwise agreed to by the Parties.

20. ACCESS

City acknowledges that access for maintenance and servicing of City's facilities located on the Project right-of-way requires a permit issued by UDOT to City, and that City must obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7.

21. INDEMNIFICATION

UDOT and City are both governmental entities subject to the Governmental Immunity Act. Each Party agrees to indemnify, defend, and save harmless the other from and against all claims, suits and costs, including attorneys' fees for injury or damage of any kind, arising out of its negligent acts, errors or omissions of its officers, agents, contractors or employees in the performance of this Agreement, and from and against all claims, suits, and costs, including attorneys' fees for injury or damage of any kind. Nothing in this paragraph is intended to create additional rights to third parties

or to waive any of the provisions of the Governmental Immunity Act. The obligation to indemnify is limited to the dollar amounts set forth in the Governmental Immunity Act, provided the Act applies to the action or omission giving rise to the protections in this paragraph. The indemnification in this paragraph shall survive the expiration or termination of this Agreement.

22. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.

b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and City.

c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

****

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

ATTEST:

Cindy Valdez

Title: Deputy Recorder

Date: 10-26-2016

(IMPRESS SEAL)

City of South Jordan

Cheryl Whatcott

Title: City Manager

Date: 10/26/2016

Approved as to Form:

Attorney for South Jordan City

Recommended For Approval:

Title: Utility and Railroad Leader

Date: _____

Utah Department of Transportation

Title: Project Director

Date: _____

Approved as to Form

Title: Assistant Attorney General

Date: _____

Comptroller Office

Title: Contract Administrator

Date: _____

CITY OF SOUTH JORDAN AESTHETIC AND LANDSCAPE BETTERMENTS

City has requested the following Betterment Work be included with the Project Utility Work:

UDOT shall include the following Aesthetics and Landscaping Betterment Work items into the Project Utility Work. UDOT shall supplement up to $100,000.00 towards Aesthetics and Landscaping Betterment Work. UDOT and City shall enter into supplemental agreements to cover Aesthetics and Landscaping Betterment Work described below. City shall be responsible for paying the actual costs greater than $100,000.00 associated with the Aesthetics and Landscaping Betterment Work items, based on the items UDOT actually installs.

Description of Aesthetics and Landscaping Betterment Work:

Element	Desired City Betterment
Railing:	1. Black vinyl coated chain-link used for chain link within Project boundaries. 2. Black powder coat all galvanized railings.
Sidewalks:	1. Replace in kind six-foot sidewalk at no betterment cost.
Lighting and Traffic Signal Poles:	1. Black powder coated signal poles, mast arms, and lights. 2. Black powder coated sign poles with decorative slip bases, and dome caps. 3. Category 1 decorative street lighting along 11400 South (bridge) matching the spacing of existing Category 1 lights within City's limits.
Park Strip, Median & Island Treatments:	1. Landscaping with sod, trees, plants, and irrigation within 11400 South remaining area at "Oval-a-Bout," north and south of the "Oval-a-bout", for remaining area that will not be constructed as part of the 11400 South roadway reconfiguration. 2. Replace in kind City landscaped park strips at no betterment costs.
Landscaping:	1. Xeriscaping with plants and Irrigation similar to I-15 and 11400 South landscaping in the vicinity of Bangerter Highway and 11400 Interchange. 2. Any existing landscaping disturbed by the Project to be replaced in kind with all existing irrigation systems reconnected.

SOUTH JORDAN CITY
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and the **City of South Jordan**, a Municipal Corporation of the State of Utah, ("City") each as ("Party") and jointly as ("Parties").

The parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the Master Utility Agreement remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)

   b. The City requirements as shown in the MUA – City Requirements, are modified as follows:
      i.

   c. Anticipated duration of Utility Work:

   d. Total estimated cost of City's (100% reimbursable) outside services: (Detailed Estimate Attached)

2. UDOT will notify the City's Project Representative, Raymond Garrison, Telephone No. (801) 253-5230, email rgarrison@sjc.utah.gov at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

ATTEST:

City of South Jordan

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(Impress Seal)

. . . . . .

RECOMMENDED FOR APPROVAL:

UTAH DEPARTMENT OF TRANSPORTATION

_____ _____

Title: Utility and Railroad Leader **Title:** Project Director

Date: _____ **Date:** _____

_____

UDOT Comptroller Office
Contract Administrator

. . . . . .

TAYLORSVILLE CITY
MASTER UTILITY AGREEMENT

THIS MASTER UTILITY AGREEMENT, made and entered into this _____day of_____, 20_____, by and between the **Utah Department of Transportation**, ("UDOT"), and **Taylorsville City**, a Municipal Corporation of the State of Utah, ("City") each as ("Party") and jointly as ("Parties").

RECITALS

WHEREAS, UDOT is preparing to request proposals for and award a design-build contract for the highway project identified as Project Number S-0154(12)11, 4 Interchanges on Bangerter Highway in Salt Lake County, Utah, ("Project"); and

WHEREAS, the design-build contractor will complete the design and administer construction of the Project ("Design-Builder"); and

WHEREAS, UDOT has identified City facilities within the limits of the Project which may necessitate the relocation, protection, or adjustment of the facilities, ("Utility Work"); and

WHEREAS, the City desires for the Design-Builder to design and perform the Utility Work on the City's facilities necessitated by the Project; and

WHEREAS, the City will perform the necessary design review and inspection to accommodate the Project; and

WHEREAS, for the purpose of expediting any required Utility Work and reimbursement, the Parties are entering into this Project Master Utility Agreement with the understanding that future supplemental agreements to this Agreement will be entered into covering the Utility Work to be accomplished by UDOT at specific Project locations.

THIS AGREEMENT is made to set out the terms and conditions where under the Utility Work shall be performed.

AGREEMENT

NOW THEREFORE, the Parties agree as follows:

1. PROJECT RESPONSIBLE FOR COST

In accordance with Utah Code § 72-6-116(3)(a)(ii), UDOT is responsible for 100% of the cost of the Utility Work of City's facilities for those costs that comply with Utah Administrative Code R930-8.

2. CONTACT INFORMATION

UDOT's Project Representative is Alana Spendlove, UDOT Project Utility and Railroad Leader, telephone number (801) 887-3462, and e-mail aspendlove@utah.gov.

UDOT's Resident Engineer for 5400 South and 7000 South interchanges is Bryan Chamberlain, telephone number (801) 887-3405, and e-mail bchamberlain@utah.gov, or their designated representative, as assigned.

UDOT's Resident Engineer for 9000 South and 11400 South interchanges is Ken Talbot, telephone number (801) 360-8750, and e-mail kentalbot@utah.gov, or their designated representative, as assigned.

UDOT's Field Representative contact person will be identified in subsequent supplemental agreements.

City's contact person is Wayne Harper, telephone number (801) 647-8701, and e-mail wharper@taylorsvilleut.gov.

After awarding the Project, UDOT will provide the City with the Design Builder contact information, hereinafter referred to as "Design-Builder Project Representative".

3. AUTHORIZATION FOR DESIGN WORK

In order to facilitate coordination and obtain technical information about the City's facilities and requirements for inclusion in this Agreement and the Request for Proposals, UDOT gave the City authorization for preliminary design engineering on July 27, 2016.

4. SUBSURFACE UTILITY ENGINEERING

UDOT has performed Subsurface Utility Engineering (SUE) within the limits of the Project. Additional SUE work to determine the precise location of underground facilities at specific, critical locations on the Project will be reviewed with the City.

5. PROJECT COORDINATION

The City requested that UDOT include items of Utility Work for relocating and adjusting City's facilities in the Project.

During the development of the Project design, the City and UDOT, along with its Design-Builder, shall consult as necessary in an effort to determine if conflicts with the City's facilities can be avoided. If Utility Work for the City's facilities is required by the Project, UDOT will be responsible to identify the conflicts and to design and construct the Utility Work of the City's facilities. The City will perform the necessary design reviews prior to the start of Utility Work. UDOT's Project Representative will be responsible for coordinating with other utility companies as it relates to City's facilities.

6. CITY REQUIREMENTS

UDOT will comply with the following City Utility Work requirements:

a. UDOT will supply as-constructed plans in AutoCad and PDF format upon completion of any required Utility Work.

7. UDOT TO DESIGN AND CONSTRUCT CITY'S UTILITY WORK

UDOT will schedule and meet with the City to review the design and scheduling of the Utility Work for the City's facilities at specific locations on the Project to ensure maximum lead-time for advance order of materials and work force scheduling.

a. UDOT will design the Utility Work in accordance with current APWA. In the event of a conflict between UDOT and APWA standards, the higher standard will be applied

b. UDOT will secure permits required for Utility Work of City's facilities.

8. RIGHT-OF-WAY

Any easements or replacement right-of-way required in conjunction with the Utility Work of City's facilities will be acquired by UDOT in accordance with the requirements of Utah Administrative Code R930-8.

9. BETTERMENT WORK

City Aesthetics and Landscaping Betterment Work is described in attached Exhibit "A" that is incorporated by reference.

If the City desires to include additional betterment work in the Project at any specific location UDOT may agree to the betterment providing the difference in costs between the functionally equivalent required Utility Work and the City's desired betterment work that is not required by the Project shall be at the sole cost of the City and the betterment work can be accommodated without delaying UDOT's Project. The betterment work will be addressed by separate supplemental agreement between UDOT and the City.

Once a Design-Builder has been selected by UDOT, any betterment work request will be negotiated directly with the Design-Builder. However, it is at UDOT's sole discretion to approve the betterment work.

10. SUPPLEMENTAL AGREEMENTS

UDOT and the City shall enter into supplemental agreements to cover Utility Work at specific Project locations. As part of the supplemental agreement, UDOT will provide design plans and Utility Work schedules for review and approval by the City prior to start of the Utility Work. A copy of the format of the proposed supplemental agreement is marked EXHIBIT "A" that is incorporated by reference.

The City will require a 2 week review and approval period for any final supplemental agreement submitted to the City by UDOT. The City does not require council review for supplemental agreement approval.

In the event there are changes in the scope of the Utility Work, extra Utility Work, or changes in the planned Utility Work covered by a supplemental agreement, a modification to the supplemental agreement approved in writing by the Parties is required prior to the start of Utility Work on the changes or additions.

11. UDOT TO NOTIFY CITY BEFORE BEGINNING UTILITY WORK

UDOT will notify the City at least 2 business days in advance of beginning any Utility Work covered by any supplemental agreements hereto, to allow the City time to schedule an inspector to be present during the Utility Work. Subsequent notification of when and where Utility Work will be performed will be given on a day-to-day basis.

12. CITY TO NOTIFY UDOT

City's personnel shall notify UDOT's Resident Engineer upon arriving and leaving the Project site for verification of inspecting Utility Work. City's personnel will comply with all applicable OSHA and Project safety requirements while within the Project limits.

13. INSPECTION

The City shall provide on-call engineering support by City's engineer or appropriate representative for design review, schedule coordination, or to correct or clarify issues during Utility

Work, and to perform the necessary inspection on the City's facilities installed by UDOT.

a. The City's engineer and/or inspector shall work with and through UDOT's Project Representative and shall give no orders directly to UDOT's Design-Builder unless authorized in writing to do so. UDOT will accomplish the Utility Work covered herein on City's facilities in accordance with the plans and specifications provided and/or approved by the City, including changes or additions to the plans and specifications, which are approved by the Parties hereto.

b. The City shall immediately notify UDOT's Project Representative and the Design-Builder Project Representative of any deficiencies in the Utility Work on the City's facilities. The City shall follow up with written detail to UDOT's Project Representative and the Design-Builder Project Representative of its findings within 24-hours of making its initial notification.

c. UDOT will respond to City's concerns within 24-hours of written notification.

d. The City, through its inspection of the Utility Work, will provide UDOT's Project Representative with information covering any problems or concerns the City may have with acceptance of the facilities upon completion of the Utility Work.

e. Any periodic plan and specification review or construction inspection performed by UDOT arising out of the performance of the Utility Work does not relieve the City of its duty in the performance of the Utility Work or to ensure compliance with acceptable standards.

14. DAILY RECORDKEEPING

UDOT's Resident Engineer will keep daily records of the inspection performed by the City. Daily inspection records will be in duplicate on a form to be prepared by the City or UDOT. The type of form to be used shall be preapproved by UDOT's Contracts, Compliance and Certification Manager. The inspection records shall be signed by UDOT's Field Representative, and the City or its authorized representatives. Copies of the inspection records shall be retained by the parties to this Agreement.

15. REIMBURSEMENT

UDOT will not reimburse the City for costs incurred by City personnel for design review, observation, inspection, and operation of valves performed as part of their regularly assigned duties. Should it become necessary for the City to procure outside services to perform design review, observation, or inspection to accommodate UDOT's Utility Work and Project schedule, the City shall notify UDOT. Upon concurrence by UDOT, a supplemental agreement for the cost of the services will be executed at which time the City may procure outside services through appropriate solicitation.

16. SUBMITTAL OF ITEMIZED BILLS

The City shall submit itemized bills covering the actual costs incurred for outside services to perform design review, oversight, and inspection work covered by supplemental agreements to UDOT's Contracts and Compliance Specialist:

UDOT Contracts and Compliance Specialist
Utah Department of Transportation
PO Box 141510
SLC UT 84114-1510

Itemized bills shall bear the Project and supplemental agreement numbers, supporting sheets, and a complete billing statement of all actual costs incurred, following the order of the items in the detailed estimates contained in the supplemental agreement and be submitted to UDOT within 60 days following completion of outside services by the City on the Project. Otherwise, previous payments to the City may be considered final, except as agreed to between the Parties in advance.

UDOT will reimburse the City within 60 days after receipt of the billings, but only for items complying fully with the provisions of Utah Administrative Code R930-8. Failure on the part of the City to submit final billings within 6 months of the completion of outside services will result in UDOT's disallowance of that portion of outside services performed by the City.

17. **SALVAGED MATERIALS**

All materials from City's existing facilities which are recovered by UDOT while performing the Utility Work and not reused on this Project shall become the property of the Design-Builder unless otherwise agreed to in advance by the Parties hereto.

18. **RIGHT TO AUDIT**

UDOT and the Federal Highway Administration shall have the right to audit all cost records and accounts of the City pertaining to this Project in accordance with the auditing procedure of the Federal Highway Administration and 23 C.F.R. § 645, subpart A. Should this audit disclose that the City has been underpaid, the City will be reimbursed by UDOT within 60 days upon submission of additional billing to cover the underpayment. Should this audit disclose that the City has been overpaid, the City will reimburse UDOT within 60 days of notification of audit findings in the amount of the overpayment. For purpose of audit the City is required to keep and maintain its records of outsides services covered herein for a minimum of 3 years after final payment is received by the City from UDOT.

19. **ACCEPTANCE AND MAINTENANCE**

Upon completion of the Utility Work of City facilities by UDOT, the City will accept, own, and maintain its own facilities. The City shall be the sole owner of the facilities upon completion of the Project unless otherwise agreed to by the Parties. To the extent it may lawfully do so, City further agrees to relieve UDOT from any responsibility or liability that may result from its new facilities or the operation thereof.

20. **ACCESS**

It is understood that access for maintenance and servicing of City's facilities located on the right-of-way of the Project will be allowed only by permit issued by UDOT to the City, and that the

City will obtain the permit and abide by conditions thereof for policing and other controls in conformance with Utah Administrative Code R930-7._**INDEMNIFICATION**

UDOT and the City are both governmental entities subject to the Governmental Immunity Act. Each Party agrees to indemnify, defend, and save harmless the other from and against all claims, suits and costs, including attorneys' fees for injury or damage of any kind, arising out of its negligent acts, errors or omissions of its officers, agents, contractors or employees in the performance of this Agreement, and from and against all claims, suits, and costs, including attorneys' fees for injury or damage of any kind. Nothing in this paragraph is intended to create additional rights to third parties or to waive any of the provisions of the Governmental Immunity Act. The obligation to indemnify is limited to the dollar amounts set forth in the Governmental Immunity Act, provided the Act applies to the action or omission giving rise to the protections in this paragraph. The indemnification in this paragraph shall survive the expiration or termination of this Agreement.

21. **MISCELLANEOUS**

a. Each Party agrees to undertake and perform all further acts that are reasonably necessary to carry out the intent and purpose of this Agreement at the request of the other Party.

b. This Agreement in no way creates any type of agency relationship, joint venture, or partnership between UDOT and City.

c. The failure of either Party to insist upon strict compliance of any of the terms and conditions, or failure or delay by either Party to exercise any rights or remedies provided in this Agreement, or by law, will not release either Party from any obligations arising under this Agreement.

d. This Agreement shall be deemed to be made under and shall be governed by the laws of the State of Utah in all respects. Each person signing this Agreement warrants that the person has full legal capacity, power and authority to execute this Agreement for and on behalf of the respective Party and to bind such Party. This Agreement may be executed in one or more counterparts, each of which shall be an original, with the same effect as if the signatures were made upon the same instrument. This Agreement may be delivered by facsimile or electronic mail.

****

IN WITNESS WHEREOF, the parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first above written.

ATTEST:

Cheryle P. Cottle

Title: City Recorder

Date: October 20, 2016

(IMPRESS SEAL)

CITY OF TAYLORSVILLE INCORPORATED SEAL JULY 1, 1996 STATE OF UTAH

Taylorsville City

Jah Tayla

Title: City Administrator

Date: 20 Oct 2016

Recommended For Approval:

Title: Utility and Railroad Leader

Date:

Utah Department of Transportation

Title: Project Director

Date:

Approved as to Form

Title: Assistant Attorney General

Date:

Comptroller Office

Title: Contract Administrator

Date:

TAYLORSVILLE CITY AESTHETIC AND LANDSCAPE BETTERMENTS

The City has requested the following Betterment Work be included with the Project Work:

UDOT will include the following Aesthetics and Landscaping Betterment Work items into the Project Work. UDOT will supplement up to $100,000.00 towards Aesthetics and Landscaping Betterment Work. UDOT and the City shall enter into supplemental agreements to cover Aesthetics and Landscaping Betterment Work described below. City will be responsible for paying the actual costs greater than $100,000.00 associated with the Aesthetics and Landscaping Betterment Work items, based on UDOT's actual quantities placed.

Description of Aesthetics and Landscaping Betterment Work:

Element	Desired City Betterment
Parapets:	Panel with "City of Taylorsville" raised lettering.
Retaining Walls:	Addition of a Taylorsville City logo plate onto the retaining wall or column.
Sidewalks:	1. Sidewalk on 5400 S to be at least 6-ft wide as part of a planned east-west trail system. 2. Include a sidewalk along the detention pond on parcel # 777 to connect Avalon Drive to 5400 S.
Lighting and Traffic Signal Poles:	Decorative street lights in project area similar to fixtures in front of city hall.
Park Strip, Median & Island Treatments:	1. Irrigation lines in sleeves under road to islands. 2. Rock mulch.
Landscaping:	Landscape areas, including detention ponds: Sprinklers and grass, with some trees. Trees should be tall growing evergreen and deciduous mix on 40' to 50' centers.

TAYLORSVILLE CITY
SUPPLEMENTAL AGREEMENT NO. ___

Supplement to UDOT Finance No. _____

THIS SUPPLEMENTAL AGREEMENT, made and entered into this _____ day of _____, 20____, **Utah Department of Transportation**, ("UDOT"), and **Taylorsville City,** a Municipal Corporation of the State of Utah, ("City") each as ("Party") and jointly as ("Parties").

The parties hereto entered in to a Master Utility Agreement (MUA) dated _____, UDOT Finance No. _____. All the terms of the Master Utility Agreement remain in full force and effect unless otherwise specified herein.

The Parties agree as follows:

1. UDOT will perform the following described Utility Work in accordance with the terms and conditions of the MUA:

   a. Description of Utility Work to be performed, including proposed location, described in Exhibit "A" that is incorporated by reference: (Plan Sheets Attached)

   b. The City requirements as shown in the MUA – City Requirements, are modified as follows:
      i.

   c. Anticipated duration of Utility Work:

   d. Total estimated cost of City's (100% reimbursable) outside services: (Detailed Estimate Attached)

2. UDOT will notify the City's Project Representative, City's contact person is Wayne Harper, telephone number (801) 647-8701, and e-mail wharper@taylorsvilleut.gov at least 48 hours in advance of beginning the Utility Work covered herein, or in accordance with the specific terms of the MUA, as applicable.

IN WITNESS WHEREOF, the Parties hereto have caused these presents to be executed by their duly authorized officers as of the day and year first written above.

ATTEST:

Taylorsville City

_____ _____

Title: _____ **Title:** _____

Date: _____ **Date:** _____

(Impress Seal)

. . . . . .

RECOMMENDED FOR APPROVAL:

UTAH DEPARTMENT OF TRANSPORTATION

_____ _____

Title: Utility and Railroad Leader **Title:** Project Director

Date: _____ **Date:** _____

_____

UDOT Comptroller Office
Contract Administrator

. . . . . .

REQUEST FOR PROPOSALS

UTAH DEPARTMENT OF TRANSPORTATION

4 Interchanges on Bangerter HWY (SR-154)

Project No. S-0154(12)11

Salt Lake County

CONTRACT DOCUMENTS

PART 7:
CONTRACT DRAWINGS

Addendum ~~5~~ 6 - ~~October~~ November ~~27~~6, 2016

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(RD)

Addendum ~~5~~ 6 - ~~October~~ November ~~27~~3, 2016

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a) 5400 South - Revised
b) 7000 South
c) 9000 South
d) 11400 South

21. 2015 Traffic Models

a) 5400 South
b) 7000 South
c) 9000 South
d) 11400 South
e) Bangerter Corridor

22. Drainage Report SR-154 Bangerter Highway 9000 South to 12600 South

23. Aqueduct Protection and Monitoring Draft Special Provisions – Moved to Part 5

REFERENCE DOCUMENTATION NOT INCLUDED IN MAIN PDF DOCUMENT; INCLUDED AS SEPARATE DOCUMENTS/ELECTRONIC FILES.